measurement SPECIALTIES™

sensing your world™

EMBEDDED SENSING TECHNOLOGIES

measurement SPECIALTIES™

WHAT CAN WE **SENSE** FOR YOU?

Measurement Specialties (MEAS) designs and manufactures sensors that measure pressure/force, position, flow, level, vibration, inertia, temperature, humidity, torque, water quality and fluid properties. Used as embedded devices by original equipment manufacturers (OEMs) or as stand alone sensors for test and measurement, our products are critical for feedback and control to enhance product functionality, efficiency and safety. We are the heart of many everyday products and provide a vital link to the physical world.

MEAS is an applications company and understands that embedded often means custom. Our portfolio includes technologies capable of measuring most physical characteristics and allows us to design the right sensor for the right application, including multi-parameter sensors. Physical property, electrical input/output and packaged configuration are all considerations when developing products that meet our customers' needs.

We have expanded our technology portfolio and geographic reach, in part through the acquisition of strategically complementary companies. Our operations in the US, Europe and China provide resources close to our customers. This global footprint allows us to offer the lowest cost of ownership to OEMs.

Our business is understanding your sensing needs and developing solutions that meet your performance and cost objectives. At MEAS, we are Sensing Your World.

Our sensors often play mission critical roles within the end device in which they are embedded. Accordingly, our customers rely on MEAS™ sensors to operate accurately, every time. At MEAS, we place the highest emphasis on quality in terms of design standards, process control and customer feedback/integration and back up our products with an industry leading warranty. MEAS maintains the highest quality certifications, including:

Quality Statements/Certifications:

- **AS/EN 9100**
- **ATEX**
- **ATEX 949EC**
- **CE-MDD**
- **CMDR – Health Canada**
- **EN 13980**
- **ESA 266**
- **ESCC266E**
- **ESCC 400C**
- **FDA**
- **ISO 13485**
- **ISO 14001**
- **ISO 9001**
- **Measuring Instruments Directive 2004/22/EC annex D**
- **NASA Qualified**
- **NSF-61 Water Quality**
- **PART21G**
- **TS 16949**

Industries Served

Engine and Vehicle
Page 2

Medical
Page 4

Environmental Monitoring
Page 5

General OEM / Industry
Page 6

Consumer Goods / Appliance
Page 7

Test and Measurement
Page 8

Military / Aerospace
Page 10

HVACR / Building Equipment
Page 12

Sensor Types

Combination
Page 13

Flow
Page 41

Fluid Properties
Page 68

Force / Torque
Page 26

Humidity
Page 38

Liquid Level
Page 52

Photo Optic
Page 63

Piezo Film
Page 64

Position
Page 42

Pressure
Page 14

Scanners
Page 66

Temperature
Page 32

Ultrasonic
(Air Bubble, Point Level, Continuous Level Monitoring)
Page 54

Vibration
Page 56

Water Resources Monitoring
Page 22

ngtechnologies

engine and vehicle

Measurement Specialties offers competitive programs for high volume automotive sensors using our TS 16949 certified facilities in France, Germany and China. We understand the rigors and demands of on- and off-road vehicles used in the trucking, commercial vehicle, construction, agriculture, forestry and mining markets. Our sensors are manufactured to exacting specifications to tolerate the high temperature, vibration, shock, pressure and long life requirements for these working vehicles.

Sensors for Engine and Vehicle applications are RoHS compliant and are matched with applications to ensure appropriate ingress protection is designed into every product. Signal outputs are provided with protection against EMI/RFI interference and cable interfacing specified to reduce risk of failure due to fatigue or accident. Selection of all materials for construction and fittings is made carefully to minimize installation and routine inspection costs.

Temperature Monitoring

Stand-alone or combined with other sensors, Measurement Specialties offers the largest range of temperature probes based on NTC, RTD Platinum or Nickel and Thermopile.

Auto Braking System

Pressure sensors are used in Electronic Stability Control systems. They detect and measure applied brake pedal pressure in order to distinguish between normal and emergency braking.

Occupant Safety

Seat, handbrake & footbrake position safety interlock switches assist operators in extreme terrains to operate safely and efficiently.

Vehicle Control

Rugged, accurate position sensors for boom position monitoring enhance operator efficiency while minimizing downtime.

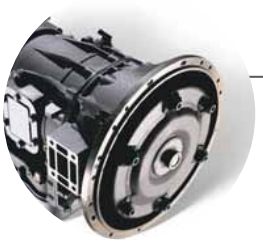
measurement SPECIALTIES™

Electronic Braking

Tilt sensors measure inclination of vehicle and automatically apply parking brake.

Engine Control

Humidity and temperature sensors are located at the air intake of internal combustion engines. The sensors are key components in systems designed to improve fuel efficiency and reduce emissions.



Oil and Fuel Levels

Stand alone or combined with temperature and/or fluid quality sensors, Measurement Specialties' level sensors are designed for off-highway, gear box, transmission and tank applications.

Fluid Quality Monitoring

Fluid property sensors directly monitor the key characteristics of oils, fuels and urea. They detect harmful contaminants and fluid condition in order to improve vehicle up-time and performance. Urea concentration and quality monitoring support proper operation of urea SCR systems to insure NOx emissions compliance.

Off-Road Mobile Hydraulics Control

Linear position and pressure sensors used in hydraulic pumps, valves and actuators provide closed loop control and monitoring in electro-hydraulic systems for such applications as excavators, vehicle lifts and cranes.

Fogging Prevention and Cabin Energy Control

Humidity and temperature sensors are used to prevent windshield fogging, critical for safety, cabin comfort and energy management.

SCR

SCR sensors measure level, quality, temperature, and as, required provide heating of DEF tanks to help emission control.

engine and vehicle

medical

Measurement Specialties has proven capabilities supplying to the OEM medical marketplace that include applications for life-sustaining, implantable medical devices. We are ISO 13485 certified and FDA registered for some product lines. We work closely with our customers to pioneer the use of sensor technology in medical equipment, devices and probes. This technology is used for the diagnosis or treatment of many pathologies including heart disease, high blood pressure, respiratory illness, renal failure and sleep apnea.

Pulse Oximeter

Photo Optic sensors provide continuous, non-invasive measurements of saturated oxygen levels in the blood.

Cardiovascular Devices

Temperature, pressure and force sensors are used for invasive cardiac monitoring, cardiac rhythm management, angioplasty and ventricular assist devices (VAD).

Infusion and Syringe Pumps

Pressure, force, ultrasonic bubble and position sensors are used to detect occlusions, bubbles, empty bag and flow rates.

Patient Monitoring

FDA-registered reusable and disposable temperature and pulse oximetry (SpO_2) probes continuously monitor patient core body temperature, pulse and blood oxygen saturation. Pressure sensors provide continuous, intravenous blood pressure measurement while MEAS piezo sensing technology is used to measure breathing patterns and patient movement.

Respiratory Devices

Temperature, humidity, pressure, position and flow sensors are used to provide precise feedback for inspired, expired and tank/wall-supplied gases in respiratory devices including sleep therapy (CPAP), oxygen concentrators and critical care and anesthesia ventilators. Our sensors improve patient comfort and device accuracy and reliability.

environmental monitoring

Measurement Specialties supports customers in the Environmental Monitoring markets; including government agencies, research institutions, academia, engineers and consultants, contractors, integrators, distributors and OEMs. Highly accurate and precise, rugged and reliable instruments meet the most demanding requirements for monitoring surface waters, groundwater, estuary and ocean waters and for managing drinking water, wastewater, storm water, landfill leachate, agricultural and hydropower systems. Our broad technology portfolio and easy-to-use products make us the supplier of choice for professionals responsible for monitoring natural waters or managing water processes.

Water Quality Data Collection
Multiparameter water-quality multiprobes measure your choice of temperature, dissolved oxygen, conductivity, pH, turbidity and a dozen other parameters manually or unattended.

Data Telemetry
Telemetry systems deliver real time water quality and/or water level data to your PC or smart phone.

Water Level Monitoring
Level data loggers and digital submersible level transducers with SDI-12 output provide highly accurate and precise water level measurements for water resource management.

Water Level Transducers
Analog submersible level transducers are extensively used for water management applications, such as pump control, lift station operation, tank level monitoring, remediation and weir and flume measurement.

general oem/industry

Measurement Specialties supports OEM customers in many commercial industries, including power generation, utilities, security, telecommunications, traffic, oil & gas, mining and construction. Our engineered sensing solutions meet the unique requirements of a wide variety of applications relating to energy, process control, automation, altitude and depth measurements and beverage flow control markets. Our broad technology portfolio and willingness to customize make us the sensor supplier of choice for industrial OEMs. From pool and spa to fuel pumps, we understand the need for sensors designed to meet challenging OEM specifications.

We provide sensor customization services ranging from special calibrations and connectors to custom label designs. Our modular sensor construction encourages a "mix and match" approach to construction that uses design engineering time efficiently. The results are products that meet user application needs delivered in a timely manner.

Our ISO certifications places the emphasis upon customers, understanding their needs and requirements and performing to their satisfaction. Further, they ensure we meet each product's statutory and regulatory requirements.

Assembly Lines

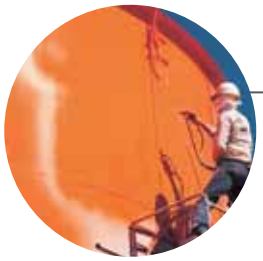
Gage heads with ultra-precision capabilities and user-adjustable pretravel and overtravel settings ensure reliable assembly line performance.

Wind Farm

Inclinometers are used to level wind turbines during construction and operation. Vibration sensors monitor the gearbox and provide early warning for maintenance.

Traffic/Smart Highway

Piezoelectric axle detectors are used to collect data on highways, as well as providing the timing mechanism for speed and red light cameras.



Industrial Paint Sprayer

Custom designed pressure sensor is used to monitor and precisely control the pressure in the paint canister to prevent splatter due to pressure spikes.

Large Electric Motors / Generators

Temperature sensors for continuous sensing and thermal monitoring. Sensors for use in stator and end windings, bearings and gear boxes.

Gasoline Pump

Rugged electromagnetic rotary encoders provide tamper proof shaft rotation measurements which are converted into gallons or liters of fuel dispensed.

consumer goods/ appliance

Sensors are increasingly being used by home consumers to improve functionality and energy management. Measurement Specialties has partnered with many major manufacturers to break new ground in the creation of "smart" applications that can respond to human touch, sense vibration and adjust automatically to different loads in order to improve efficiency of operation.

Washer/Dryer
Low cost/low power vibration sensor measures load imbalance to avoid "walking". Humidity or thermopile sensors are used in dryers to automatically shut off when clothes are dry, extending the life of clothes and improving efficiency.

Cycle Computers
Altimeters based on barometric pressure sensors enable measurement of route profiles and contribute to energy monitoring and fitness estimation.

Navigation
Height measurement based on a miniature barometric pressure sensor enables route profile calculation and logging for outdoor devices. Differences in height measurements are used in automotive after-market GPS.

Wellness Body Monitoring
Low-powered miniature digital sensors allow a range of vital body wellness indicators to be calculated, such as energy consumption, sleep quality and activity monitoring.

Sport Watches
Water depth for diving is accurately measured by gel-filled digital pressure sensors. Altimeter watches use barometric pressure variation for height measurement and pressure trends for weather prediction.

Printers
The drying process of ink jet printers is improved by monitoring air and paper humidity content. Measuring air and toner humidity guarantees print quality in laser printers/copiers.

Microwave Oven
Measurement Specialties' infrared temperature sensors monitor heating functions by directly sensing food temperature.

Refrigerator
Humidity control inside refrigerator keeps vegetables fresh while humidity monitoring outside refrigerator improves efficiency by avoiding costly defrost cycles.

test and measurement

measurement SPECIALTIES™

Flight Testing
Aircraft manufacturers are constantly pushing the flight envelope of their designs to the new frontier. Unexpected test parameters become the norm rather than the exception, and standard off-the-shelf solutions are usually inadequate. These mission-critical test applications often require the best in DC accelerometers, load cells and miniature pressure transducers, especially when it comes to thermal stability. Measurement Specialties has partnered with many major aerospace suppliers to come up with customized sensing solutions.

Wind Tunnel Aerodynamics
Aerodynamic testing of aircraft, automobiles and civil engineering structures requires high numbers of pressure measurements, often within confined spaces inside wind tunnel models. The ESP line of miniature pressure scanners combines 16, 32 or 64 pressure sensors with a calibration valve within the industry's smallest package. Individual temperature sensors provide active digital temperature compensation to virtually eliminate thermal sensitivity.

Turbo Machinery
Gas turbine engine and component testing requires high numbers of pressure and temperature measurements. The testing environment is often demanding with high vibration, acoustic noise and presence of harsh fluids. The NetScanner instrumentation brand provides a rugged, networkable system solution of multi-channel instruments to measure gas pressure, liquid pressure, temperature and barometric pressure.

Process Control & Factory Automation
Process control is used extensively to facilitate mass implementation of continuous processes in food production, oil refining, paper manufacturing, chemicals, power plants and many other industries. Process control enables automation on the factory floor to maximize efficiency and improve quality with the help of a variety of sensors, such as string potentiometers, pressure transducers, accelerometers, and temperature sensors.

Flutter Testing
Silicon MEMS, Plug and Play accelerometers for high accuracy over temperature.

Wind Tunnel
Miniature pressure sensors and pressure scanners for airflow measurements.

Turbo Machinery
Pressure, vibration and temperature instrumentations for engine test cell measurements.

Process Control & Factory Automation
Position, pressure, vibration, and temperature sensors for monitoring factory equipments.

measurement SPECIALTIES™

Automotive Safety Testing

A five-star-rated vehicle can only be designed when the test engineers have accurate crash test data. Measurement Specialties is the largest sensor supplier for auto safety testing, supplying high quality accelerometers, string pots, miniature pressure sensors and other state-of-the-art technologies. We lead the way in product innovations and customer satisfaction.

Automotive Design & Test

From engine and transmission development to vehicle NVH testing, sensors are an integral part of the research and development cycle. Measurement Specialties provides the automotive industry with pressure transducers, load cells, accelerometers, gyros, LVDT's, torque meters, temperature sensors and fluid property analyzers for a wide variety of applications. The broad spectrum of sensing technologies available at our disposal has served our customers especially well in a cost-conscious economic environment.

Motorsports

In auto racing, sensors provide real-time, critical feedback about vehicle dynamics to the engineering team that can often affect the outcome of a race. The high vibration and temperature test environments in an engine or drive train have always been challenging for typical sensing devices. Measurement Specialties has long been a favored supplier to Formula One teams for acceleration, pressure, force, position and other dynamic sensors. We offer the most advanced lines of accelerometers, gyros and pressure transducers and back them up with impeccable reliability records and customer service.

Pedestrian Safety Testing
Sensors with precise damping characteristic provide reliable impact measurements.

Crash Testing
SAE J2570 and ISO-6487 compliant sensors for anthropomorphic instrumentation.

Component Design/ Road Simulation
Rugged IEPE Accelerometers for suspension testing. Standard off-the-shelf accelerometers, steering wheel torque sensors and brake/pedal force sensors.

Racing Sensors
High accuracy silicon MEMS pressure sensors and triaxial accelerometers for track mapping.

test and measurement

military / aerospace

Long development cycles and high qualification costs require aerospace firms to identify stable, reliable, cost-effective partners. Measurement Specialties has AS9100 certified facilities in the USA, France and China which support Tier 1, 2 and 3 providers with a wide variety of critical sensor solutions for aerospace applications.

Commercial / Military Aircraft
Fuel Tank Level/Flow
MEAS custom glass thermistor/heater assemblies are an industry standard in fuel systems used to monitor and control fuel level, position and flow.

Commercial / Military Aircraft
Flight Controls / Instrumentation
MEAS LVDT's and RVDT's are used in cockpit controls and actuation systems. Flight recorders detect loss of cabin pressure. Pitot tubes measure air speed. Variometers indicate rate of ascent/descent. Force sensors convey information for flight data recording and autopilot disconnection.

Commercial / Military Aircraft
Engine Thrust Reverser
MEAS rugged LVDT's provide feedback to the cockpit to ensure thrust reversers have properly deployed.

Commercial / Military Aircraft
Load Path Monitoring
Force sensors for load monitoring on control surfaces and secondary load path. Torque transducers for brake system monitoring.

Commercial / Military Aircraft
Brake Pedal Transmitters
MEAS custom potentiometers are used for feedback in brake pedal transmitters.

Commercial Aircraft
Cockpit Controls
MEAS custom potentiometers are used for position feedback in a Flap Position Indicator.

Commercial Aircraft
Flight Controls
MEAS custom potentiometers are used in yaw and pitch flight control actuators for position feedback.

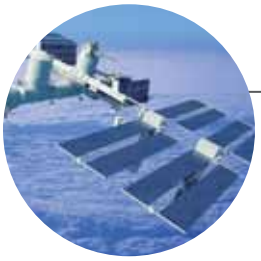
measurement SPECIALTIES™

Military Aircraft
Cargo Handling Systems
MEAS custom hall effect position sensors are used for position feedback on cargo handling systems.

Commercial / Military Helicopter
Gearbox Monitoring
MEAS high frequency accelerometers are used for critical Health and Usage Monitoring Systems (HUMS) for helicopters.

Commercial Helicopters
Cockpit Instruments
MEAS custom motorized potentiometers are used in cockpit engine instruments for position feedback.

Military Helicopter
Position Feedback
MEAS custom potentiometers are used in yaw and roll flight control actuators for position feedback.



Space/Satellite
Satellite
MEAS is the only sensor company who maintains both NASA and ESA qualifications. We developed the interchangeable glass encapsulated thermistor which today is a standard for aerospace high reliability applications. MEAS LVDT's are used for mirror and antenna positioning.

Space/Satellite
Space Propulsion
MEAS custom potentiometers are used in launch engine fuel valve control applications.

Missile
Fin Actuation
MEAS custom potentiometer/hall effect position sensors provide feedback of fin movement during flight to guidance system.

UAV/Drones
Position Feedback
MEAS custom potentiometers are used in yaw, roll and pitch flight control actuators for position feedback.

military / aerospace

hvacr / building equipment

Our indoor environments are becoming more comfortable and efficient to maintain due to the growth of innovative technologies and supportive sensor networks that regulate heating, ventilation and air conditioning. Sometimes this just entails the control of air velocity to improve convective cooling but more often it requires a complete system to add or remove heat from buildings, control heat and moisture within spaces as well ensure good air quality. While temperature, humidity and pressure sensors are the most common sensors found in HVACR and building equipment applications, one also sees increasing use of sensors for vibration, liquid level, fluid property, and water quality monitoring.

Ice Makers
Water quality, temperature sensors and bin level sensors for control and regulation of ice-making systems.

Hot Water Boilers
Low cost temperature probes with fast response time and rugged brass housings provide accurate temperature measurements for industrial grade boiler systems.

Fire Systems
Sensors are integrated with automated control systems to monitor building temperature and to maintain proper water pressure in the fire suppression system.

Cooling Tower
Measurement Specialties' vibration sensors monitor condition of fan and gearbox to prevent catastrophic failures.

Transport and Case Refrigeration Systems
Temperature sensors are used to measure air supply to control compartments while immersion probes measure refrigerant temperature. Rugged sensors designed specifically for measuring refrigerant pressure are used in conjunction with variable speed compressors to improve system efficiency.

Chillers / Heat-Exchangers
Differential pressure measurements across the chiller provide an indication of flow rate. The higher the flow rate, the higher the differential pressure.

LVDTs provide valve position feedback in variable capacity refrigerant compressor controls.

combination

solutions by sensor type

Measurement Specialties is a global innovator in the design and manufacture of two or more sensing technologies into one compact package. Our combination sensors provide OEMs and end-users with significant cost savings that start with the initial purchase and flow through their respective systems, as they realize economies of time, reduced space requirements and simpler assembly processes.

Combination

Trican (P+T+Rh)

Multi-parameter modules measure pressure, temperature and relative humidity for engine management applications.

Force and Torque

The multi-axial FN7325 measures force along three axes as well as the corresponding torque.

Pressure and Temperature

Combined pressure and temperature sensing saves weight, space and reduces plumbing and electrical connections in various auto racing, aerospace and industrial applications.

Water Quality Multiprobes

Water quality probes can utilize a wide range of measurement technologies for spot checking/profiling or for deployment in real time web-to-water monitoring.

Fluid Properties Sensor

Novel fluid properties sensor that directly and simultaneously measures the viscosity, density, dielectric constant and temperature of fluids for advanced fluid quality monitoring applications.

Contamination SCR Sensor

The SCR sensor provides a CAN output combination of temperature, level and quality of urea (AdBlue® / DEF) measurement in tank. The sensor also includes various heater designs to connect to coolant loop.

pressure

solutions by sensor type

Measurement Specialties leads the industry with a wide array of standard and custom pressure products ranging from board level components to fully amplified and packaged transducers, based on piezoresistive microelectromechanical (MEMS) and silicon strain gauge (Microfused™) technology. Our products measure pressure ranging from inches of water (<5 mbar) to 100K psi (7K bar), making us ideally suited for medical, HVACR, off-road/heavy equipment and general industrial applications. We manufacture the world's lowest power and smallest package pressure sensors for altimeter/ NAV applications. Our sensors are signal conditioned, calibrated over temperature and include digital or analog outputs. Customized packaging and electronics make MEAS the supplier of choice for OEMs.

Silicon Die and Microstructures

For OEM Applications

	MS72xx	MS7310	P6393	P7405
Unique Features	–Piezoresistive pressure die –Top cavity - hermetic sensor –For harsh environment	–Piezoresistive pressure die –Low pressure sensor –High sensitivity	–Piezoresistive pressure die –Silicon-pyrex construction –Open bridge	–Piezoresistive pressure die for high pressure applications –Open bridge
Linearity	±0.05% Typical FSO (MS7212A)	±0.5% FSO	±0.1% FSO	±0.25% FSO
Output / Span	150 mV at 5 V	110 mV at 5 V	110 mV at 1.5 mA	125 mV at 1.5 mA
Type	Absolute	Differential	Differential, absolute	Absolute
Pressure Range	0 - 1, 7, 12, 18, 28 bar / 0 - 14.5, 102, 174, 261, 406 psi	0 - 100 mbar / 0 - 1.45 psi	0 - 0.14, 0.35, 0.69, 1, 2, 3, 17, 34 bar / 0 - 2, 5, 10, 15, 30, 50, 250, 500 psi	0 - 69, 207, 345, 689 bar / 0 - 1000, 3000, 5000, 10000 psi
Overpressure	FS range dependent 5 bar / 73 psi (MS7201-A2) 170 bar / 2466 psi (MS7228-A)	6 bar / 87 psi (front side)	5X	3X
Operating Temp	-40°C to 150°C	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C
Dimensions (mm)	1.35 x 1.79 (MS7201-A2) 1.95 x 1.63 (MS7212-A)	2.45 x 2.45	2.9 x 3.9	1.70 x 1.70
Typical Apps	Braking systems, transmission systems, engine controls	Heating ventilation and air conditioning, medical, industrial controls	Process control, automation, refrigeration	Can be packaged in an isolated oil-filled transmitter for harsh media

Disposable Medical Products

mV Outputs

	1620, 1630	Fully Assembled 1620 (Customized per customer specifications)
Package	Invasive blood pressure monitoring	Invasive blood pressure monitoring
Type	Gage	Gage
Pressure Range	-30 to 300 mmHg / -1.2 to 11.8 inHg	-30 to 300 mmHg / -1.2 to 11.8 inHg
Output / Span	5 µV/V/mmHg / 0.04 µV/V/inHg	5 µV/V/mmHg / 0.04 µV/V/inHg
Unique Features	–Low cost, disposable design –Supplied in tape and reel –Compliant to AAMI spec	–Low cost, disposable design –Compliant to AAMI spec –ISO13485 Certified –Custom designs available
Accuracy	1.0% FSO	1.0% FSO
Operating Temp	10°C to 40°C	10°C to 40°C
Dimensions (mm)	1620: 8.13 x 11.43 x 4.20 1630: 5.08 x 12.7 x 3.94	42.8 x 30.3 x 19.0
Typical Apps	Disposable blood pressure, surgical procedures, ICU, kidney dialysis machines, medical instrumentation	Disposable blood pressure, kidney dialysis machines, surgical procedures and intensive care units. Ready to use, fully assembled disposable sensor units with cable, connector, stop cock, flush device in a plastic housing.

Board Mounted Pressure Sensors

mV Output

	1210, 1220, 1230, 1240	13, 23, 33, 43, 17, 27, 37, 47	MS52xx, MS54xx
Package	8 pin DIL	TO-8	Surface mount
Type	Gage, absolute, differential	Gage, absolute, differential	Gage, absolute
Pressure Range	0 - 5 & 10" H_2O 0 - 0.07, 0.14, 0.35, 1, 2, 3, 7 bar / 0 - 1, 2, 5, 15, 30, 50, 100 psi	0 - 0.07, 0.14, 0.35, 0.69, 1, 2, 3, 7, 17 bar / 0 - 1, 2, 5, 10, 15, 30, 50, 100, 250 psi	0 - 1, 12 bar / 0 - 15, 174 psi (MS52xx) 0 - 1, 7, 12 bar / 0 - 15, 102, 174 psi (MS54xx)
Output / Span	50 mV and 100 mV typical	100 mV typical	150 mV, 240 mV
Unique Features	–Temperature compensated –High performance UltraStable™ die (1230, 1240) –Current excitation(1210, 1230) –Voltage excitation(1220, 1240)	–Temperature compensated –High performance UltraStable™ die (17, 27, 37, 47) –Can gel fill for humid conditions	–Small size (MS54xx) –High linearity or high sensitivity options –Plastic tube or metal ring options –With gel to protect against moisture –High endurance (Option HM)
Accuracy	±0.1% Non-linearity	±0.1% Non-linearity	±0.05% or ±0.2% Non-linearity
Operating Temp	-40°C to 125°C	-40°C to 125°C	-40°C to 125°C
Dimensions (mm)	15.2 x 19.2	Ø 11.4, height model dependent	7.6 x 7.6, height model dependent (MS52xx) 6.4 x 6.2 (MS54xx)
Typical Apps	Medical instruments, air flow measurement, HVACR, process control, factory automation, leak detection	Medical instruments, air flow measurement, HVACR, process control, factory automation, leak detection	Absolute pressure sensor systems, engine controls, high resolution altimeters, variometers, waterproof watches, divers' computers, barometers, tire pressure monitoring systems (TPMS), medical instrumentation, pneumatic controls

Amplified Output

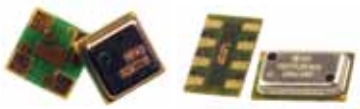
	MS1451, MS1471	MS4425, MS4426	MS4515, MS4525
Package	Surface mount	6 pin DIL	8 pin DIL
Type	Gage, absolute	Gage, absolute, differential	Gage, differential (MS4515) Gage, absolute, differential, compound (MS4525)
Pressure Range	0 - 0.35, 1, 2, 3, 7, 17, 34 bar / 0 - 5, 15, 30, 50, 100, 250, 500 psi	0 - 0.07, 0.35, 1, 2, 3, 7, 10, 21 bar / 0 - 1, 5, 15, 30, 50, 100, 150, 300 psi	0 - 2, 4, 5, 10, 20, 30" H_2O (MS4515) 0 - 0.07, 0.14, 0.35, 1, 2, 3, 10 bar / 0 - 1, 2, 5, 15, 30, 50, 150 psi (MS4525)
Output / Span	60 mV typical	60 mV, 90 mV, and 100 mV typical	10% to 90% or 5% to 95% of supply
Unique Features	–Low cost –Coarse calibrated at room temp (MS1471) –With gel to protect against moisture –Tube or hole	–Temperature compensated –High performance UltraStable™ die –Voltage excitation	–Ratiometric analog output sensor –Single supply of either 3.3 or 5.0 Vdc –Top, side barbed or manifold O-ring port –J lead or thru hole pins –Optional gel coat
Accuracy	±0.25% Non-linearity	±0.1% Non-linearity	0.25% / 1% TEB
Operating Temp	-40°C to 125°C	-25°C to 85°C	-25°C to 105°C
Dimensions (mm)	7.6 x 7.6, height model dependent	15.2 x 13.7	12.5 x 9.9
Typical Apps	Altitude measurement, barometric pressure, medical instrumentation, consumer appliances, tire pressure	Drop-in for 6 pin industrial sensor for PCB mounted medical, HVACR	Medical instruments, air flow measurements, process control, leak detection

Board Mounted Pressure Sensors

Digital Output Modules

	MS58xx	MS4515DO, MS4525DO MS4515HRD, MS4525HRD	MS5525DSO NEW
Unique Features	–24-bit digital sensor, software calibration and temperature compensation (I²C & SPI), no external components –Supply voltage 1.8 to 3.6V	–14-bit digital sensor (MS4515 / 25DO) –24-bit digital sensor (MS4515 / 25HRD) –Pressure and temperature measurement –Single supply of 3.3 or 5.0Vdc (MS4515 / 25DO) –Single supply of 1.8 or 3.6Vdc (MS4515 / 25HRD) –Top, side barbed or manifold O-ring port –J lead or thru hole pins –Fast conversion up to 0.54ms (MS4515 / 25HRD) –Ultra low power consumption (MS4515 / 25HRD)	–24-bit digital small outline sensor –Pressure and temperature measurement –Single supply of 1.8 or 3.6Vdc –Top straight/barb, flat top, o-ring seal
Options	High endurance (Option HM)	Gel coat, low power (MS4515 / 25DO)	—
Linearity/Absolute Accuracy	±1.5 mbar / ±0.02 psi at 25°C (MS5803-01BA) ±250 mbar / ±4 psi at 0°C to 40°C (MS5803-30BA)	0.25% / 1% TEB	0.25% / 2.5% TEB
Output / Span	Digital 24-bit I²C and SPI (Mode 0, 3)	14-bit digital word SPI or I²C protocol (MS4515 / 25DO) 24-bit digital word SPI or I²C protocol (MS4515 / 25HRD)	24-bit digital word SPI or I2C protocol
Resolution	12 µbar / 0 psi (MS5803-01BA) 0.5 mbar / 0.01 psi (MS5803-30BA)	—	—
Type	Absolute	Gage, differential (MS4515DO, MS4515HRD) Gage, absolute, differential, compound (MS4525DO, MS4525HRD)	Gage, absolute, differential, compound
Pressure Range	1, 2, 5, 14, 30 bar / 15, 29, 73, 203, 435 psi	0 - 2, 4, 5, 10, 20, 30" H_2O (MS4515DO/HRD) 0 - 0.07, 0.35, 1, 2, 3, 10 bar / 0 - 1, 5, 15, 30, 50, 150 psi (MS4525DO/HRD)	0 - 0.07, 0.14, 0.35, 1, 2, 3, 10 bar 0 - 1, 2, 5, 15, 30, 50, 150 psi
Overpressure	10 bar / 145 psi (for 1 & 2 bar modules) 30 bar / 435 psi (for 5 & 14 bar modules) 50 bar / 725 psi (for 30 bar modules)	0.69 bar / 10 psi (MS4515DO, MS4515HRD) 3X range (MS4525DO, MS4525HRD)	3X range
Operating Temp	-40°C to 85°C	-25°C to 125°C	-40°C to 125°C
Dimensions (mm)	6.4 x 6.2 x 2.9	12.5 x 9.9	11.4 x 7.4
Typical Apps	Precision altimeter, diving and multi-mode watches, in-building navigation, variometers / flight instruments	Medical instruments, air flow measurements, process control, leak detection	Medical respirators, ventilators

Digital Output Altimeter Modules



	MS5637 NEW	MS5805 NEW	MS5806 NEW
Unique Features	–24-bit digital sensor –High-resolution module, 13cm –Supply voltage: 1.5 to 3.6V –Low power, 0.6µA (standby ≤ 0.1 µA at 25°C)	–24-bit digital sensor –High resolution module, 20cm –Supply voltage: 1.8 to 3.6V –Low power, 0.6µA (standby ≤ 0.1 µA at 25°C) –Sealing designed for 2.5 x 1 mm O-ring –Silicone gel protection –Waterproof	– 24-bit digital sensor –High resolution module, 20cm –Supply voltage: 1.8 to 3.6V –Low power, 1µA (standby ≤ 0.15 µA) –Hermetically sealable for outdoor devices –Silicone gel protection –Waterproof
Linearity/Absolute Accuracy	±2.0 mbar / ±0.03 psi at 25°C	±2.0 mbar / ±0.03 psi at 25°C	±1.5 mbar / ±0.02 psi at 25°C
Output/Span	Digital 24-bit I²C	Digital 24-bit I²C	Digital 24-bit I²C and SPI (Mode 0, 3)
Resolution	0.016 mbar / 0 psi	0.02 mbar / 0 psi	0.024 mbar / 0 psi
Type	Absolute	Absolute	Absolute
Pressure Range	10 - 2K mbar / 0.15 - 29 psi	10 - 2K mbar / 0.15 - 29 psi	10 - 2K mbar / 0.15 - 29 psi
Overpressure	6 bar / 87 psi	5 bar / 73 psi	10 bar / 145 psi
Operating Temp.	-40 to 85°C	-40 to 85°C	-40 to 85°C
Dimensions (mm)	3 x 3 x 0.9	4.5 x 4.5 x 3.5	6.4 x 4 x 2.75
Typical Apps	Smart-phones, tablet PCs, personal navigation devices	Mobile altimeter/barometer systems, bike computers, adventure or multi-mode watches, variometers, dataloggers	Mobile altimeter/barometer systems, bike computers, adventure or multi-mode watches, variometers, dataloggers

Media Isolated Pressure Sensor Modules

Analog Output
O-Ring Mount and Threaded/Weldable

	82, 85, 85F, 86, 154N	DP86 O-Ring Mount, with Fittings/Cable	U86B
Package	–3/4" (19mm) diameter O-ring mount (82 / 154N) –5/8" (16mm) diameter O-ring mount (86) –1/2" (13mm) diameter O-ring flush mount (85F) –1/2" (13mm) diameter O-ring mount (85)	–5/8" (16mm) diameter O-ring mount or threaded process fittings	–Mountable with O-ring seal
Type	Gage, absolute, vacuum gage (82 / 85 / 86 / 154N) Gage, absolute (85F)	Differential	Sealed gage, absolute
Pressure Range	0 - 0.07, 0.35, 1, 2, 3, 7, 21, 34 bar / 0 - 1, 5, 15, 30, 50, 100, 300, 500 psi (absolute, gage: 82 / 154N) 0 - 0.35, 1, 2, 3, 7, 21, 34 bar / 0 - 5, 15, 30, 50, 100, 300, 500 psi (absolute, gage: 85 / 86) 0 - 1, 2, 3, 7, 21, 34 bar / 0 - 15, 30, 50, 100, 300, 500 psi (85F, vacuum gage: 82, 85, 86,154N)	0 - 0.07, 0.35, 1, 2, 3, 7, 10, 21, 34 bar / 0 - 1, 5, 15, 30, 50, 100, 300, 500 psi	0 - 3, 7, 10, 14 bar / 0 - 50, 100, 150, 200 psi
Output/Span	100mV typical	100mV typical / sensitivity dependent	0.5 - 4.5 Vdc (Ratiometric output)
Unique Features	–High performance –High stability for OEM applications –Minimizes trapped volume (85F)	–Wet/wet differential pressure –Line pressure max 1000 psi	–Amplified
Non-Linearity	±0.3% FSO (1 psi / 0.07 bar) ±0.1% FSO (≥15 psi / 1 bar) ±0.2% FSO (5 psi / 0.35 bar) ±0.1% FSO (85F)	±0.3% FSO (1 psi / 0.07 bar) ±0.2% FSO (5 psi / 0.35 bar) ±0.1% FSO (≥15 psi / 1 bar)	±0.5% FSO
Operating Temp.	-40°C to 125°C (82 / 85 / 86 / 154N) -20°C to 125°C (85F)	-40°C to 125°C	-7°C to 105°C
Dimensions (mm)	82: Ø 19 x 6.4 154N: Ø 19 x 13.8 85: Ø 15.9 x 9.3 86: Ø 15.9 x 9.3 85F: Ø 17.2 x 11.4	O-ring: Ø 15.9 x 17.5 Fittings: 55.4 x 26.2 x 25.4	Ø 15.82 x 13.6 Socket spacing: 31.75
Typical Apps	Hydraulic controls, process control, oceanography, refrigeration/ compressors, pressure transmitters, level systems, dialysis machines, infusion pumps, medical systems	Level controls, tank level measurement, corrosive fluids and gas measurement systems, flow measurement	Urea level, urea pressure, air brakes, corrosive fluid measurement for E&V applications

	82, 85 with Fittings	89 Button, 89 with Fittings	86A Amplified
Package	Weldable (85) or process fitting	Weldable or process fitting	5/8" (16 mm) diameter O-ring mount
Type	Gage, absolute, vacuum gage	Sealed gage, absolute	Gage, absolute
Pressure Range	0 - 0.35, 1, 2, 3, 7, 21, 34 bar / 0 - 5, 15, 30, 50, 100, 300, 500 psi (85) 0 - 0.07, 0.35, 1, 2, 3, 7, 21, 34 bar / 0 - 1, 5, 15, 30, 50, 100, 300, 500 psi (82)	0 - 69, 207, 345 bar / 0 - 1K, 3K, 5K psi	0 - 0.07, 0.14, 0.35, 1, 2, 3, 7, 10 bar / 0 - 1, 2, 5, 15, 30, 50, 100, 150 psi
Output/Span	100 mV typical	100 mV typical	0.5 - 4.5 Vdc
Unique Features	–Modular design	–High pressure, modular design	–Small diameter, amplified output –Bar ranges available
Non-Linearity	±0.3% FSO (1 psi / 0.07 bar) ±0.2% FSO (5 psi / 0.35 bar) ±0.1% FSO (≥15 psi / 1 bar)	±0.25% FSO	±1.0% FSO
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-20°C to 85°C
Dimensions (mm)	82: Ø 22.2 x 24.9 85: Ø 22.2 x 29.3	89 Button: Ø 9.0 x 7.5 89 with Fittings: Ø 22.2 x 23.6	Ø 15.9 x 9.3, height model dependent
Typical Apps	Medical, process control, refrigeration compressor, oceanography, level systems	Air tank pressure, hydraulics, process control, robotics, refrigeration compressors, oceanography	Level measurement, OEM transmitters and transducers, process control

Media Isolated Pressure Sensor Modules

Digital Output
O-Ring Mount and Threaded/Weldable

	85BSD NEW	86BSD NEW	89BSD NEW
Package	–13 mm diaphragm diameter –Weldable or threaded process fittings –Pressure and temperature read-out –Cable and connector options –Low power option	–16 mm diaphragm diameter –O-ring mount –Pressure and temperature read-out –Cable and connector options –Low power option	–9 mm diaphragm diameter –Threaded/weldable –Pressure and temperature read-out –Low power: 1 µA (standby < 0.15 µA)
Accuracy	±0.25% Span	±0.25% Span	±0.3% Span
Output/Span	Digital 14-bit I²C or SPI	Digital 14-bit I²C or SPI	Digital 24-bit I²C
Total Error Band	±1.0% FSO	±1.0% FSO	±3.0% FSO Max
Type	Gage, Absolute	Gage, Absolute	Absolute, Sealed Gage
Pressure Range	0 - 0.35, 1, 2, 3, 7, 10, 14, 20 bar / 0 - 5, 15, 30, 50, 100, 150, 200, 300 psi	0 - 0.07, 0.14, 0.35, 1, 2, 3, 7, 10, 14, 20 bar / 0 - 1, 2, 5, 15, 30, 50, 100, 150, 200, 300 psi	0 - 6, 12, 18, 28, 30 bar / 0 - 87, 174, 261, 406, 435 psi
Overpressure	2X	2X	2X
Operating Temp.	-40°C to 125°C	-40°C to 125°C	-40°C to 85°C
Dimensions (mm)	Ø 15.9 x 7.9	Ø 15.9 x 9.3	Ø 9.0 x 7.5
Typical Apps	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, submersible depth monitoring	Level controls, tank level measurement, corrosive fluids and gas measurement systems, sealed systems, manifold pressure measurement, dive computers

Transducers and Transmitters

Base Level and Custom

	MSP100	MSP300, MSP340, US300	M5200, U5200, D5100 NEW
Package	Small housing with O-ring and proprietary 'Snap in' feature that lowers the total installed cost and customized housings for OEM applications	Small housing with a large selection of threaded fittings, electrical connectors, cable options and customized housings for OEM applications	Industrial stainless steel housing with a large selection of threaded fittings, electrical connectors, cable options and customized housings for OEM and T&M applications
Type	Gage	Gage (MSP300, MSP340) Gage, Absolute (US300)	Gage (M5200) Gage, sealed gage, absolute (U5200) Differential wet-wet (D5100)
Pressure Range	0 - 7 bar thru 0 - 34 bar / 0 - 100 psi thru 0 - 500 psi	0 - 3 bar thru 0 - 2K bar / 0 - 50 psi thru 0 - 30K psi (MSP300) 0 - 7 bar thru 0 - 2K bar / 0 - 100 psi thru 0 - 30K psi (MSP340) 0 - 1 bar thru 0 - 344 bar / 0 - 15 psi, thru 0 - 5K psi (US300)	0 - 3 bar thru 0 - 2K bar / 0 - 50 psi thru 0 - 30K psi (M5200) 0 - 0.14 bar thru 0 - 700 bar / 0 - 2 psi thru 0 - 10K psi (U5200) 0 - 0.07 bar thru 0 - 34 bar / 0 - 1 psi thru 0 - 500 psi (D5100)
Output/Span	100 mV typical	0 - 100mV, 0.5 - 4.5Vdc, 1 - 5Vdc, 4 - 20mA (MSP300, MSP340) 0 - 10mV/V, 0.5 - 4.5V, 1 - 5V, 4 - 20mA (US300)	0.5 - 4.5 Vdc, 1 - 5 Vdc, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA
Unique Features	–Microfused™ technology –Low cost stainless steel isolated transducer –No threads needed for pressure connect –Highly customized for OEM application –Small size –Solid state reliability	–Microfused™ technology (MSP300, MSP340) –UltraStable™ technology (US300) –Highly customized for OEM applications –Small size –Solid state reliability	–Microfused™ technology (M5200) –UltraStable™ technology (U5200, D5100) –High performance at a low cost –Solid state reliability 1% total error band (-20°C to 85°C all possible errors combined) (M5200, D5100) –0.75% total error band (-20°C to 85°C all possible errors combined) (U5200) –Line pressure max 1000 psi (D5100)
Accuracy	0.5% FSO	<1% FSO	0.25% FSO (M5200, D5100), 0.1% FSO (U5200)
Operating Temp.	0°C to 55°C	-20°C to 85°C (MSP300, MSP340) -40°C to 105°C (US300)	-40°C to 125°C
Dimensions (mm)	12.7 x 24.38 x 20.32	MSP300: 22.23 x 22.23 x 55.88 MSP340: 15.88 x 15.88 x 75.44 US300: 15.88 x 115.88 x 98.00	M5200: 22.23 x 22.23 x 80.77 U5200: 22.23 x 22.23 x 98.04 D5100: 25.4 x 58.4 x 72.0
Typical Apps	Beverage dispensing systems, automation, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment	Paint sprayers, braking systems, HVACR controls, energy and water management, pumps, compressors, pneumatic equipment, off road heavy equipment, agriculture equipment	HVACR controls, energy and water management, pumps, compressors, pneumatic equipment, off road heavy equipment, trucks, agriculture equipment, braking systems, filter blockage, pressurized tank level
Agency Approvals	—	UL 508 (MSP300)	CE (EMC), UL 508

Transducers and Transmitters

Heavy Duty

	M7100, U7100	U5300 NEW
Package	Automotive grade, stainless steel hermetic pressure ports and integral electrical connector	Environmentally protected stainless steel housing with a large selection of threaded fittings, electrical connectors, cable options and customized housings for OEM applications
Type	Gage, no vent gage (M7100) Gage, sealed gage, absolute (U7100)	Gage, absolute, sealed gage
Pressure Range	0 - 10 thru 0 - 689 bar / 0 - 150 thru 0 - 10K psi (M7100) 0 - 1 thru 0 - 10 bar / 0 - 15 thru 0 - 150 psi (U7100)	0 - 1 thru 0 - 689 bar / 0 - 15 psi thru 0 - 10K psi
Output/Span	0.5 - 4.5 Vdc [Ratiometric Output]; 1 - 5 Vdc [Regulated] (M7100) 0.5 - 4.5 Vdc [Ratiometric Output] (U7100)	0.5 - 4.5 V, 0 - 5 V, 1 - 5 V, 0 - 10 V, 4 - 20 mA
Unique Features	–1% total error band (-20°C to 85°C) –Solid state reliability –Survives high vibration and immersion –Microfused™ technology (M7100) –UltraStable™ technology (U7100)	–UltraStable™ technology –High accuracy –Digitally compensated –Pressure calibration standard –IP65 rated –0.5% total error band from -25°C to 85°C
Accuracy	0.25% FSO	0.1% FSO
Operating Temp.	-40°C to 125°C	-25°C to 85°C
Dimensions (mm)	26.7 x 26.7 x 50.0	22.23 x 22.23 x 98.04
Typical Apps	HVACR refrigeration controls, off road vehicles engine control, compressors, hydraulic, energy and water management	Aerospace testing, calibration, high end machinery, automotive, industry
Agency Approvals	CE (EMC), UL 508	CE (EMC), UL 508

	P900, P981, P1200, P700, P9000	P101, P105, P125
Package	Threaded ports with stainless steel housing and various heavy duty electrical connections, various electrical outputs	Threaded port
Type	Gage, absolute	Gage
Pressure Range	0 - 5 bar to 0 - 689 bar / 0 - 75 psi to 0 - 10K psi	0 - 10 bar to 0 - 7K bar / 0 - 145 psi to 0 - 101K psi
Output / Span	0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA	7.5 to 15 mV (4 V; 5 V optional)
Unique Features	–High overpressure (10X over pressure) –Shock & vibration resistant –Heavy Industrial grade transducer (P9000) –Advanced digital compensation / calibration –Mechanical over pressure stops –High temperature operation	–Stainless steel diaphragm –Pressure connector M20 x 1.5 –Metal / metal seal
Accuracy	0.1% to 0.2% FSO	±0.3% FSO
Operating Temp	-54°C to 120°C	-20°C to 80°C
Dimensions (mm)	Application dependent	Ø 29 x 85
Typical Apps	Steel mills, hydraulic controls, power generation equipment, torpedo depth, mil-aero, vehicle braking systems	Hostile environments, aggressive liquids
Agency Approvals	CE, CENELEC (Intrinsically Safe)	—

	XP Series NEW	XPC10 NEW
Unique Features	–Titanium construction (XP5, XPM4) –Stainless steel housing (XPM6, XPM10) –Amplified output options (XP5, XPM6, XPM10) –Cable and connector options (XPM4) –For static and dynamic applications	–Amplified output available –For static and dynamic applications –Optional IP67 ingress protection –High temperature operation
Non linearity	Up to ±0.25% FSO (XP5, XPM6, XPM10) Up to ±0.35% FSO (XPM4)	Up to ±0.25% F.S.
Output / Span	20, 30, 75, 100mV (XP5) 30mV, 60mV, 100mV (XPM4) 100mV (XPM6) 50, 100mV (XPM10)	12mV FSO, 4V FSO (amplified)
Pressure Range	1 - 345 bar / 15 - 5K psi (XP5, XPM10) 5 - 207 bar / 75 - 3K psi (XPM4) 103 - 1K bar / 1.5K - 15K psi (XPM6)	0 - 10, 21, 34, 52, 69, 103, 207, 345, 517 bar / 0 - 150, 300, 500, 750, 1K, 1.5K, 3K, 5K, 7.5K psi
Overpressure	2X	1.5X
Operating Temp	-40°C to 120°C	-40°C to 220°C
Dimensions (mm)	XP5: Hex 10 XPM4: Hex 8 XPM6: Hex 12 XPM10: Hex 15	Hex 15
Typical Apps	Corrosive liquids and gases, braking system pressure, onboard equipment monitoring, military and aerospace, explosive test benches, robotics and effectors, laboratory and research, extreme miniature devices	Aerospace, test benches, oven monitoring equipment, cooling regulation systems

	EB, EPRB	EPIH	EPB, EPB-PW, EPL
Unique Features	–High accuracy –Miniature design –UltraStable™ technology –EMI protected –Combined pressure & temperature	–Diffused silicon diaphragm with a large variety of sizes and shapes available as small as 0.05" outside diameter –High frequency response(to 1.7 MHz)	–Miniature flush mountable –Flush stainless steel diaphragm, flanged and / or non-flanged –Bonded silicon gage, high frequency response (to 400 KHz) –IP68 ingress protection in Titanium construction (EPB-PW)
Non linearity	±0.25% FSO	±1.0% FSO	±0.5 to ±1% FSO
Output / Span	0.5 to 4.5 Vdc	12 mV to 75 mV	10 mV to 125 mV
Pressure Range	0 - 21, 34, 69, 103, 207, 345 bar / 0 - 300, 500, 1K, 1.5K, 3K, 5K, psi	0 - 0.35, 0.69, 1, 2, 3, 5, 7, 14, 21 bar / 0 - 5, 10, 15, 25, 50, 75, 100, 200, 300 psi	0 - 0.35, 0.69, 1, 2, 3, 5, 7, 17, 34, 69, 172, 345 bar / 0 - 5, 10, 15, 25, 50, 100, 250, 500, 1K, 2.5K, 5K psi
Overpressure	2X to 3X	2X to 5X	2X to 10X
Operating Temp	-40°C to 125°C (available option up to 150°C)	-40°C to 120°C	-40°C to 120°C
Dimensions (mm)	11 body diameter	Application dependent	3.2 to 7 outside diameter
Typical Apps	Motor sport, hydraulic/pneumatic systems, automotive test stands, mil-aero test stands	Aerospace testing, wind tunnels, biomedical testing, aircraft body and wing dynamics, high frequency measurements	Air flow testing, hydraulic pressure systems, air pressure systems, bearing studies, ballistics, water hammer, miniature scale model testing, centrifuge pore water pressure measurements

water resources monitoring

solutions by sensor type

Measurement Specialties leads the water-resources monitoring market with over thirty-five years of industry experience in the design and manufacture of water-quality and water-level sensors and systems. Our expertise in media-isolated pressure sensors provides our customers with unique advantages in creative product development and consistent product performance.

Water-level transducers are available in custom ranges and a wide choice of accuracies, materials, and cabling. With your choice of analog or digital output, our sensors are easily adapted to any data system. Or, use self-powered units with onboard memory for long term deployment.

We also provide multiparameter, water-quality instrumentation for the most demanding analyses of lakes, rivers, estuaries, and aquifers worldwide. Our multiprobes measure your choice of temperature, dissolved oxygen, conductivity, pH, water depth or level, ORP, turbidity, chlorophyll, crude oil, blue-green algae, ammonium, nitrate and a dozen other parameters critical to water-resources improvement and preservation. Call our water-quality specialists today to discuss our solutions to your monitoring problems.

Manta2 Water Quality Multiprobes

Sensors for Multiprobes Are Customer-selectable and Easily Configured

Measurement Specialties' Manta2 line of water-quality multiprobes has a configuration to meet any demanding application. With your choice of 24 different sensors, they can be used as unattended water-quality data loggers with the optional battery pack, or with the rugged field display for spot checking/profiling. Connected to our Eureka TS2 telemetry system they can be deployed for real-time water-to-web monitoring or to other data collection systems. Our water-quality specialists carefully review all monitoring applications prior to making equipment recommendations to ensure all customers receive exactly what is required for their projects.

	Temperature	Dissolved Oxygen (mg/L)		Conductivity
Range	-5°C to 50°C	0 to 25 mg/L	25 to 50 mg/L	0 to 100 mS/cm
Accuracy	±0.1°C	1% of reading or 0.2 mg/L, whichever is greater	±0.2 mg/L ≤20 mg/L ±0.6 mg/L >20 mg/L	1% reading ±1 count
Resolution	0.01°C	0.01 mg/L	0.01 mg/L	4 digits
Comments	Never needs calibration	Salinity corrected	Salinity corrected	Automatic temperature compensated; graphite electrodes

	Salinity	TDS	Turbidity	
Range	0 to 70 PSU (PPT)	0 to 65 g/L	0 to 400 NTU	400 to 3000 NTU
Accuracy	±1% of reading or 0.1 PSU, whichever is greater	±5% of reading	±1% of reading ±1 count	±2% of reading
Resolution	4 digits	4 digits	4 digits	4 digits
Comments	Calculated from conductivity	Calculated from conductivity	ISO 7027	ISO 7027

	pH	ORP	Depth	Level	Ammonium
Range	0 to 14 units	- 999 to 999 mV	0 to 10 m, 0 to 25 m, 0 to 50 m, 0 to 100 m, 0 to 200 m	0 to 10 m	0 to 100 mg/L Nitrogen
Accuracy	±0.2 units	±20 mV	±0.1% Full Scale	0.003 m	±10% of reading or 2 mg/L, whichever is greater
Resolution	0.01 units	1 mV	0.01 m	0.001 m	0.1 mg/L - N
Comments	Automatic temperature compensated	Platinum electrode		Vented transducer; requires vented cable	Ion Selective Electrode with replaceable plasticized tips

	Nitrate	Chloride	Chlorophyll a	Rhodamine	Blue Green Algae
Range	0 to 100 mg/L Nitrogen	0.5 to 18,000 mg/L	0.03 to 500 µg/L	0.04 to 1000 ppb	150 to 300,000 cells/mL
Accuracy	±10% of reading or 2 mg/L, whichever is greater	±10% of reading or 2 mg/L, whichever is greater	±3% of full scale	±3% of full scale	±3% of full scale
Resolution	4 digits	4 digits	0.01 µg/L	0.01 ppb	10 cells/mL
Comments	Ion Selective Electrode with replaceable plasticized tips	Ion Selective Electrode with replaceable plasticized tips	Turner sensor	Turner sensor	Fresh or marine available, Turner sensor

Water Resources Monitoring

Level Data Loggers

	TruBlue 555, 565 Level, 575 Baro, 585 CTD
Accuracy	±0.1 FS TEB (TruBlue 555, 575) ±0.01 ft H_2O (TruBlue 565) 1% of reading or 20 µs/cm (TruBlue 585)
Range	10 - 692 ft (TruBlue 555) 10 - 50 ft (TruBlue 565) 8 - 16 psia (TruBlue 575) 5 - 200,000 µs/cm (TruBlue 585)
Max Over-range	2x FS (TruBlue 555, 565, 585) 32 psia (TruBlue 575)
Output	RS-485
Data Logging Memory	8 MB
Operating Temp	0°C to 50°C
Dimensions (mm)	19 x 390
Typical Apps	Groundwater monitoring, surface water monitoring, oceanographic research, barometric pressure, atmospheric pressure

Digital Level Transducers

	KPSI 500, 501
Accuracy	±0.05% FS TEB (KPSI 500) ±0.01 ft H_2O (KPSI 501)
Range	10 - 230 ft (KPSI 500) 10 - 50 ft (KPSI 501)
Max Over-range	2X FS
Output	SDI-12
Data Logging Memory	—
Operating Temp	-20°C to 60°C
Dimensions (mm)	25.4 x 197
Typical Apps	Groundwater monitoring, surface water monitoring, oceanographic research

	KPSI 351, 353, 355
Accuracy	±0.10% FS TEB (KPSI 353) ±0.05% FS TEB (KPSI 355) ±0.01 ft H_2O (KPSI 351)
Range	10 - 230 ft (KPSI 353, 355) 10 - 50 ft (KPSI 351)
Max Over-range	2X FS
Output	SDI-12
Data Logging Memory	—
Operating Temp	-20°C to 60°C
Dimensions (mm)	19 x 243
Typical Apps	Groundwater monitoring, surface water monitoring, oceanographic research

Digital Temperature Transducers

	KPSI 380
Accuracy	±0.1°C
Range	-20°C to 60°C
Connection	open port nosepiece
Output	SDI-12, RS-485
Operating Temp	-20°C to 60°C
Dimensions (mm)	19.0 x 127.0
Typical Apps	Groundwater monitoring, surface water monitoring, storm water, dam operations and stream gauging

Telemetry Communication Systems

	Eureka TS2 NEW
Power	12 - 24 VDC
Environmental	NEMA4
Sensor Ports	RS-485, RS-232 (3 Multiplexed), SDI-12
Communication	GPRS
Supported Hardware	Manta2 Multiprobes, TruBlue Data Loggers, KPSI Digital Level Transducers
Typical Apps	Surface and groundwater monitoring

Water Resources Monitoring

Analog Level Transducers — 1″ Bore

	KPSI 700, 710, 720, 730, 735	KPSI 705, 745, 750 NEW	LTA, LTB, LTR, LT Series
Level Accuracy	±0.10%, ±0.05% FSO (KPSI 730, 735) ±0.25%, ±0.50%, ±1.00% FSO (KPSI 700, 710, 720)	±0.25% FSO	±0.25% FSO
Options	—	Optional standoff (KPSI 745)	Optional lightning protection
Range	Custom ranges from: 5 - 700 ft H_2O (vented, KPSI 730, 735) 35 - 700 ft H_2O (sealed, KPSI 730, 735) 2.3 - 700 ft H_2O (vented, KPSI 700, 710, 720) 10 - 700 ft H_2O (sealed, KPSI 700, 710, 720) 35 -- 700 ft H_2O (absolute, KPSI 700, 710, 720)	Custom ranges from 6 - 115 ft H_2O (KPSI 705) Custom ranges from 10 - 115 H_2O (KPSI 745, 750)	0 - 1 psi up to 0 - 500 psi (LTA, LT) 0 - 11.5, 34.6, 69.2, 115.4 ft H_2O (LTB, LTR) Custom ranges available
Max Over-range	2X FS	2X FS	2X FS
Output	4 - 20 mA, 0 - 5 Vdc, 0 - 2.5 Vdc, 0 - 4 Vdc, 0 - 10 Vdc, 1.5 - 7.5 Vdc	4 - 20 mA, 0 - 5 Vdc, 0 - 2.5 Vdc, 0 - 4 Vdc, 0 - 10 Vdc, 1.5 - 7.5 Vdc	4 - 20 mA (LTA, LTB, LT) 4 - 20 mA, 0 - 2.5Vdc, 0 - 4 Vdc, 1.5 - 7.5 Vdc (LTR)
Operating Temp	-20°C to 60°C	-20°C to 60°C	-20°C to 60°C
Dimensions (mm)	25.4 x 86.6	KPSI 705: 25.4 x 86.6 KPSI 745: 88.9 x 279.4 (w/ standoff) 88.9 x 253.3 (w/o standoff) KPSI 750: 104.1 x 279.4	LTA: 25.4 x 93.0 LTB: 104.1 x 206.5 LTR: 11.30" w/ overmold conduit connection 9.78" w/ gland seal conduit connection LT: Ø 25.4 x 170.5 (dependent on fitting)
Typical Apps	Groundwater monitoring, surface water monitoring, oceanographic research, pump control, life stations, landfill leachate	Wastewater, lift stations, pump control, slurry tank liquid level, tank level	Pump control, tank liquid level, landfill leachate monitoring, construction bypass pumping, dewatering, lift station monitoring, submersible tank liquid level, liquid line pressure, slurry tank liquid level, wastewater
Agency Approvals	CE, WEEE, RoHS; UL and FM (Intrinsically safe)	CE, WEEE, RoHS; UL and FM (Intrinsically safe)	CE, WEEE, RoHS; with optional UL, CUL, and FM (Intrinsically safe)

Analog Level Transducers — 0.75″ Bore

	KPSI 320, 330, 335, 342	KPSI 300DS
Level Accuracy	±0.10%, ±0.05% FSO (KPSI 330, 335) ±0.25% FSO (KPSI 320) ±0.25% FS TEB (KPSI 342)	±0.50% FSO
Range	Custom ranges from: 5 - 700 ft H_2O (vented: KPSI 320, 330, 335) 35 - 700 ft H_2O (sealed, absolute: KPSI 330, 335) 10 - 700 ft H_2O (sealed: KPSI 320, 342) 35 - 700 ft H_2O (absolute: KPSI 320, 342) 2.3 - 700 ft H_2O (vented: KPSI 342)	Custom ranges from: 700 - 4614 ft H_2O
Max Over-range	2X FS	2X FS
Output	4- 20 mA, 0 - 5 Vdc, 0 - 2.5 Vdc, 0 - 4 Vdc, 0 - 10 Vdc, 1.5 - 7.5 Vdc (KPSI 320, 330, 335) 4 - 20 mA, 0 - 5 Vdc (KPSI 342)	4 - 20 mA, 0 - 5 Vdc, 0 - 2.5 Vdc, 0 - 4 Vdc, 0 - 10 Vdc, 1.5 - 7.5 Vdc
Operating Temp	-20°C to 60°C -20°C to 85°C (KPSI 342)	-20°C to 60°C
Dimensions (mm)	19 x 151	19 x 215
Typical Apps	Groundwater monitoring, surface water monitoring, oceanographic research, pump control, lift stations, landfill leachate, tailrace and forebay monitoring	Down hole, level control, pump control
Agency Approvals	CE, WEEE, RoHS; UL and FM (Intrinsically safe) (KPSI 320, 330, 335) CE, WEEE, RoHS (KPSI 342)	CE, WEEE, RoHS

force/torque

solutions by sensor type

Measurement Specialties is a pioneer in the design and manufacture of precision sensors for electro-mechanical flight control applications, test and measurement applications and ultra-low cost OEM load cells for high volume applications. We are experts in developing sensors that require high performance or unique packaging.

Based on our proprietary piezoresistive silicon strain gauge (Microfused™) technology our OEM load cells combine outstanding durability and long-term stability in extremely low cost packages, perfectly suited for medium and high volume applications.

Our flight-qualified sensors monitor secondary load path engagement and supply real time information from primary flight control forces to the Flight Data Recorder (Black Box). Other applications include force feedback for autopilot automatic disconnect function and flap jam detection systems.

MEAS' OEM and T&M load cells are tailored for specific customer applications including custom packaging and electronics with analog or digital outputs, suited for both low and high force environments.

Load Cells

Low Cost OEM

	FX19	FS20	FC22	FC23
Package	Low profile “coin cell” design	Miniature; drop in replacement for industry standard	Plastic housing, button, flange mounting	Stainless steel housing button shape for higher weight loads
Operating Mode	Compression	Compression	Compression	Compression
Unique Features	–Ultra low cost, low strain design –Essentially unlimited cycle life	–Load cell design operates at very low strains –Not subject to lead die fatigue	–Low cost button shape –Essentially unlimited cycle life	–Industry standard low profile all stainless steel design –Resistant to off-axis loads.
Ranges (Lbf)	10, 25, 50, 100	1.5, 3	25, 50, 100	250, 500, 1000, 2000
Max Over-range	2.5X	10 lbf	2.5X	1.5X and 2.5X
Output / Span	100 mV	1.0 to 4.0 V	100 mV, 0.5 to 4.5 Vdc	100 mV
Combined Linearity & Hysteresis	±1.0% FSO	±1.0% FSO	±1.0% FSO	±1.0% FSO
Operating Temp	-40°C to 85°C	0°C to 70°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	Ø 25.00 x 29.50 x 8.00	30.708 x 17.272 x 8.255	Ø 26.00 x 42.00 x 19.50	Ø 31.75 x 10.20
Typical Apps	Consumer OEM, exercise machines, physical therapy, vending machines, appliances, pumps, medical devices	Infusion pumps, contact sensing, medical devices, consumer appliances	Infusion pumps, robotics end-effectors, exercise machines, contact sensing, appliances	Batch weighing, robotics, assembly line force, printing presses, pumps, winch and hoist

Test and Measurement
Miniature

	ELAF	XFC200R	XFL212R	XFTC300 Series
Package	–Button –Dual stud	Small diameter load button	Low profile load button	Low/high capacity dual stud
Operating Mode	–Compression –Tension	Compression	Compression	Tension and compression
Unique Features	–Low cost –Small, low profile design –Low off-axis response –NIST traceable calibration provided	–High stiffness –High overload capacity –Static and dynamic	–Extremely flat –Integrated load button –Small diameter	–High stiffness –High overload capacity –Threaded male / female fitting
Ranges N (Lbf)	50 to 10K (10 to 2K)	2 to 10K (0.4 to 2K)	5 to 500 (1 to 100)	2 to 2K (0.4 to 400)
Max Over-range	2.5X F.S.	2X to 4X F.S.	2X F.S.	2X to 4X F.S.
Output / Span	100 mV (0.5 - 4.5 V optional)	100 mV	100 mV	100 mV (4 V; ±5 V optional)
Non-linearity	±0.25% F.S.	≤ ±0.5% F.S.	≤ ±0.5% F.S.	≤ ±0.5% F.S.
Hysteresis	±0.25% F.S.	≤ ±0.5% F.S.	≤ ±0.5% F.S.	≤ ±0.5% F.S.
Optional Operating Temp	-40°C to 120°C (-40°F to 248°F)	-40°C to 150°C (-40°F to 302°F)	-40°C to 150°C (-40°F to 302°F)	-40°C to 150°C (-40°F to 302°F)
Dimensions (mm)	Ø 12.70 x 9.53 or 8.80 Ø 15.88 x 12.70 or 11.70 Ø 31.75 x 10.20	Ø10 to Ø16	Ø12.5 x 3.5	Application dependent
Typical Apps	Theatrical rigging loads, assembly forces, weighing, thrust measurements, product validation testing	Material test, measuring tools, robotics and effectors	Dental and biomechanical, surface mount assembly system, production validation test	Material test, tool forces, robotics end effectors

torque

Load Cells

Standard

	ELHM, ELHS	FN3002	FN2420	FN1010
Package	High capacity dual stud or button style	Very high capacity dual stud	Very high capacity load button	Load pin design
Operating Mode	Tension and compression	Tension and compression	Compression	Tension and compression
Unique Features	–Tension and compression or compression only –High stability metal foil strain gage (ELHM) –High output semiconductor strain gage (ELHS) –NIST traceable calibration provided	–Threaded male fitting –Integrated amplifier –Optional rod end	–High stiffness –Optional load button –Optional high level output module	–Keyed antirotation slot –Bidirectional available –Optional watertight construction
Ranges N (Lbf)	1K to 50K (200 to 10K)	10K to 2,000K (2K to 400K)	20K to 5,000K (4K to 1,000K)	10K to 2,000K (2K to 400K)
Max Over-range	1.5X F.S.	1.5X F.S.	1.5X F.S.	1.5X F.S.
Output / Span	10 mV (ELHM), 200 mV FSO (ELHS)	±20 mV (4 V; ±5 V optional)	20 mV (4 V; 5 V)	±20 mV (4 V; ±5 V; 4 - 20 mA optional)
Non-linearity	0.3% to 0.5% FSO	±0.25% F.S.	±0.1% F.S.	±1% F.S.
Hysteresis	Combined with linearity	Combined with linearity	±0.1% F.S.	Combined with linearity
Optional Operating Temp	-50°C to 120°C (ELHM), -20°C to 80°C (ELHS)	-40°C to 150°C (-40°F to 302°F)	-40°C to 150°C (-40°F to 302°F)	-20°C to 80°C (-4°F to 176°F)
Dimensions (mm)	Application dependent	Application dependent	Application dependent	Application dependent
Typical Apps	Robust general purpose, low deflection design: machine tool, linkage forces	Assembly forces, tool force, offshore	Calibration presses, robotics and effectors, laboratory and research	Crane monitoring, offshore, load-limited devices

S-Beam Standard

	FN3030	FN3060	FN3148	FN7110
Package	S-beam	S-beam	S-beam with stops	Dual S-beam range
Operating Mode	Tension and compression	Tension and compression	Tension and compression	Tension and compression
Unique Features	–Optional rod ends –Optional high level output –Low cost	–Fatigue rated –Optional high level output –S-beam technology	–Very high accuracy –High resolution –Mechanical stops	–High resolution –Optional high level output –Double range
Ranges N (Lbf)	50 to 100K (10 to 20K)	250 to 2.5K (50 to 500)	10 to 2K (2 to 400)	10 / 100 to 1K / 10K (2 / 20 to 200 / 2K)
Max Over-range	1.5X F.S.	1.5X F.S.	5X to 100X F.S.	1.2X F.S. of the higher range
Output / Span	±20 mV (4 V; ±5 V optional)	±15 mV (4 V; ±5 V optional)	±20 mV (4 V; ±5 V optional)	±20 mV (4 V; ±5 V optional)
Non-linearity	±0.1% F.S.	±0.1% F.S.	< ±0.05% F.S.	±0.1% F.S. of each range
Hysteresis	Combined with linearity	Combined with linearity	Combined with linearity	
Optional Operating Temp	-40°C to 150°C (-40°F to 302°F)	-40°C to 120°C (-40°F to 248°F)	-40°C to 120°C (-40°F to 248°F)	-20°C to 80°C (-4°F to 176°F)
Dimensions (mm)	Application dependent	50 x 25 x 60	Application dependent	60 x 30 x 100
Typical Apps	Laboratory and research, process control, robotics and effectors	Test bed, dynamic fatigue testing, robotics and effectors	Product validation tests, medical instruments, weighing	Product validation tests, process control, robotics and effectors

Load Cells

Low Profile and Pan-Cake

	FMT	FN3050	FN3000	FN7325
Package	Washer	Pan-Cake	High capacity Pan-Cake	Custom design/ranges available upon request
Operating Mode	Compression	Tension and compression	Tension and compression	Multiaxial force and torque
Unique Features	–High stiffness –1.5X over-range –High temperature	–Connector or cable gland output –Same housing all ranges –Optional high level output –Optional compression stops	–High stability –Aluminum or stainless steel –Optional high level output	–Measures Load / Torque in 3 directions –Fatigue rated –Minimal cross effects
Ranges N (Lbf)	20K to 320K (4K to 64K)	100 to 20K (20 to 4K)	10K to 1000K (2K to 200K)	5K to 250K (1K to 50K)
Max Over-range	1.5X F.S.	1.5X F.S. (10X F.S. with stops)	1.5X F.S.	1.2X F.S.
Output / Span	15 to 20 mV	±15 mV (4 V; ±5 V optional)	±20 mV (4 V; ±5 V optional)	±100 to 150 mV (4 V; ±5 V optional)
Non-linearity	1 to 5% F.S.	±0.1% F.S.	±0.1% F.S.	±1% F.S.
Hysteresis	Combined with linearity	±0.1% F.S.	±0.1% F.S.	Combined with linearity
Optional Operating Temp	-40°C to 150°C (-40°F to 302°F)	-40°C to 150°C (-40°F to 302°F)	-40°C to 150°C (-40°F to 302°F)	-20°C to 80°C (-4°F to 176°F)
Dimensions (mm)	Application dependent	Ø70 x 25	Application dependent	Application dependent
Typical Apps	Robotics, process control, bolt clamping for bridges	Regulation, laboratory and research, robotics	Static fatigue tests, weighing calibration, robotics	Structure testing, crash testing, industrial test benches

Torque Meters

Reaction and Rotary

	CS1060	CS1120	CS1210	CD1050
Package	Square male coupling	Keyed shaft connections	Collar mechanical fittings	Square male couplings
Operating Mode	Reaction	Reaction	Reaction	Dynamic rotary
Unique Features	–Optional high level output –Static measurements	–Optional high level output –Excellent temp. stability	–High stiffness –Optional high level output	–Optional high level output –Rugged
Ranges Nm(Lbf-ft)	±5 to ±7K (±4 to ±5.6K)	±5 to ±2.5K (±4 to ±2K)	±160 to ±10K (±128 to ±8K)	±5 to ±7K (±4 to ±5.6K)
Max Over-range	1.5X F.S.	1.5X F.S.	1.5X F.S.	1.5X F.S.
Output / Span	±20 mV (4 V; ±5 V optional)	±20 mV (4 V; ±5 V optional)	±20 mV (4 V; ±5 V optional)	±20 mV (4 V; ±5 V optional)
Combined Non-linearity & Hysteresis	< ±0.25% F.S.	< ±0.25% F.S.	< ±0.25% F.S.	< ±0.25% F.S.
Optional Operating Temp	-20°C to 100°C (-4°F to 212°F)	-20°C to 100°C (-4°F to 212°F)	-40°C to 150°C (-40°F to 302°F)	-20°C to 80°C (-4°F to 176°F)
Dimensions (mm)	Application dependent	Application dependent	Application dependent	Application dependent
Typical Apps	Non-rotating parts torque measurement, robotics and effectors, laboratory and research	Non-rotating parts torque measurement, robotics and effectors, laboratory and research	Non-rotating parts torque measurement, robotics and effectors, laboratory and research	Engine efficiency, robotics and effectors, laboratory and research

Automotive Design and Test Sensors

	FN4070 - FN4080	FN2317	FN2114 - FN2570
Package	Seat belt buckle sensor	Hand brake	Brake pedal
Operating Mode	Tension	Compression	Compression
Unique Features	–High operating ranges –Detachable tongue and cable –Compatible with most seat belts	–Easily installed –Ergonomic design –Fits most vehicles	–High accuracy –Extra flat –Compact –Rugged design
Ranges N (Lbf)	250 to 50K (50 to 10K)	500 to 1K (100 to 200)	200 to 3K (40 to 600)
Max Over-range	1.5X F.S.	1.5X F.S.	1.5X F.S.
Output / Span	15 to 20 mV	±20 mV (4 V optional)	15 to 20 mV (4 V optional)
Non-linearity	±0.5% F.S.	±0.5% F.S.	< ±1% F.S. (FN2114); < ±2.5% F.S. (FN2570)
Hysteresis	Combined with linearity	Combined with linearity	Combined with linearity
Optional Operating Temp	-20°C to 80°C (-4°F to 176°F)	-20°C to 80°C (-4°F to 176°F)	-20°C to 80°C (-4°F to 176°F)
Dimensions (mm)	Application dependent	100 x 20 x 15	Application dependent
Typical Apps	Auto crash testing, tension at the belt receptacle	Hand brake, test bed	Brake pedal, clutch pedal, test bed

	FN7080	FCA7300	EL20-S458
Package	Gear stick design	Steering wheel adaptable	Special purpose design optimized for automotive crash test environments
Operating Mode	Multi-axial	Multi-sensing	Seat-belt tension
Unique Features	–Measures force in three directions –Replaces gear knob –Ease of mounting	–Dual torque / Angle range –Steering velocity measurement –Fits all road vehicles	–Low mass titanium design for use in high shock environments –Mass optimized to minimize acceleration induced errors during SAE J2570 ATD and ISO 6487 –Optional high level and linearized outputs –Smoothed edge design and optional slotted titanium axles eliminate drag errors and dummy damage –Ultra robust cable is user replaceable
Ranges N (Lbf)	50 to 500 (10 to 100)	10 to 200 Nm (7 lbf-ft to 150 lbf-ft)	5K and 15K (1000 and 3200)
Max Over-range	1.2X F.S.	10X F.S.	2X
Output / Span	±7.5 mV (4 V; ±5 V optional)	±10 V	10 mV (0.5 - 4.5 V optional)
Non-linearity	< ±0.3% F.S.	±0.1% F.S.	1.0% to 3.0% F.S.O.
Hysteresis	Combined with linearity	±0.1% F.S.	Combined with linearity
Optional Operating Temp	-20°C to 80°C (-4°F to 176°F)	-20°C to 80°C (-4°F to 176°F)	-40°C to 120°C (-40°F to 248°F)
Dimensions (mm)	Ø 25 (0.98) spherical	Ø 195 x 50	Application dependent
Typical Apps	Change gear force measurement, roughness of material	On car road test, truck and buses steering test, armored vehicles steering test	Seat belt forces, safety and restraint system crash test, parachute tether/riser forces

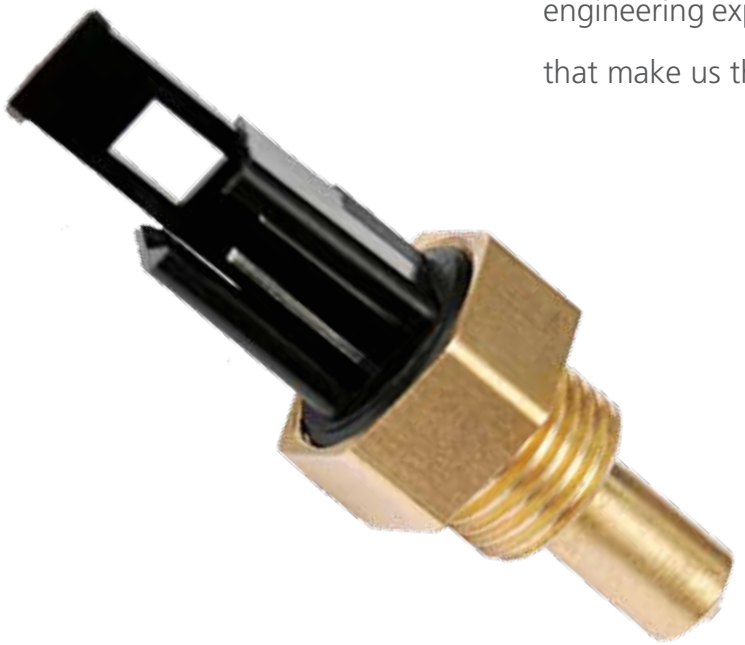
Electronics / Displays

	ARD154	M210	M905
Package	Din rail mountable	Front panel or housed in case	Front panel or housed in case
Operating Mode	Signal conditioning for Wheatstone bridge sensors	Signal conditioning and display meter	Display suited for process or strain gauge type sensors
Unique Features	–Suited for full bridge strain gage sensors –120 to 10000 Ohm bridge Impedance –±10 V Analogue or 0 / 4 - 20 mA current output –2 kHz or 20 kHz max. bandwidth –Calibration pushbutton from 0.1 to 10 mV/V	–Analog output : ±10 V –Red LED display : ±2,000 count –High bandwidth: 1,000 Hz at -3 dB –Low noise level	–Suited for process or strain gauge type sensors –5 digits: -19999 to 19999 –Front panel programming –11 point scaling –Plug-in option boards
Ranges N (Lbf)	Application dependent	Application dependent	Application dependent
Output / Span	±10 V max; 4 - 20 mA or 0 - 20 mA	±10 Vdc	±10 Vdc or 4 - 20 mA with option
Accuracy	0.01% F.S.	±0.05% F.S.	±15 bits, 20 sample/sec
Optional Operating Temp	-10°C to 60°C (14°F to 140°F)	0°C to 50°C (32°F to 122°F)	-10°C to 60°C (14°F to 140°F)
Dimensions (mm)	99 x 17.5 x 112	96 x 48 x 155	96 x 48 x 60
Typical Apps	Test stands, power plants, manufacturing systems, test and measurement, test bed regulation, automat interfaces	High bandwidth test bed display, monitoring, laboratory and research, process control equipment	Display on test bed, monitoring, laboratory and research

temperature

solutions by sensor type

Measurement Specialties (MEAS) is the market leader in temperature measurement. MEAS manufactures NTC thermistors, RTDs, thermocouples, thermopiles, digital output and customized sensor assemblies. Building on over 100 years of experience, our unique know-how allows MEAS to cover the largest range of temperature measurement, control and compensation applications in the industry. We offer the widest selection of temperature products which meet the specific demands of temperature sensing OEM applications including medical, aerospace, automotive, instrumentation appliances, motor control and HVACR. MEAS has years of extensive and successful support to these industries. You can count on Measurement Specialties to deliver high quality products, engineering expertise and cost-effective temperature solutions that make us the number one choice for your application.



Sensing Elements— NTC, RTD, Digital Output

Analog Output

NTC	Thermistor Chips	Radial Leaded Thermistors NEW	Axial Leaded Thermistors NEW
Package	Leadless Chips SMD 0402, 0603, 0805	Radial, beads	DO-35
Type	Gold or silver electrodes, Surface mounted	Epoxy or glass coated	Glass coated
Resistance Range	Chip:100 to 1MΩ / SMD:40 to 500kΩ	100 to 1MΩ	5kΩ to 100kΩ
Unique Features	–Wire bonding compatible –End band SMD	–Interchangeable –Moisture resistant –Stability	–Tight tolerance (±1%) –Max stability using high density (HD) chip –Hermetically sealed –Tinned & Nickel plated leads
Accuracy	±1% to 10%	0.25% to 20%	±1% to ±3%
Operating Temp.	-40°C to 125°C	-55°C to 280°C	-40°C to 300°C
Dimensions (mm)	Chip: 0.6mm - 1.0 mm square SMD 0402: 1 x 0.5 x 0.7 SMD 0603: 1.6 x 0.8 x 1 SMD 0805: 2 x 1.25 x 1.2	0.4 to 4.9	2.0 x 4.0 body
Typical Apps	Temperature compensation, communication (DWDM), infrared sensing systems, PCB mounting temperature measurement	Temperature sensing for OEM, automotive, medical, HVAC	Refrigeration including cabinet sensing and evaporator coil, white goods, fire detection units, air-conditioning systems, PCB temp sensing

	Space Qualified (Hi-Rel)	Nickel RTD
Package	Radial, bead, custom	–SOT 23 –Bare die on request
Type	NTC, Epoxy, glass, probes	–Thin film nickel structure on silicon substrate, protected with a passivation layer –SOT23 package for SMT –Bare die for COB assembly
Resistance Range	1kΩ to 100kΩ	1000Ω
Unique Features	–ESA and NASA approved –High reliability and accuracy	–Harsh environment compatible –Automotive qualified –Very small dimensions –Very short response time –Good linearity –High temperature coefficient –Low power consumption –Good thermal connection of sensing element through leadframe-pin
Accuracy	0.5% to 10%	Class B, according to former DIN 43760 standard
Operating Temp.	-55°C to 115°C	-55 °C to 160 °C
Dimensions (mm)	From 2.4	2.1 x 2.5 x 2.1 (SOT23) 0.7 x 0.7 x 0.4 (bare die)
Typical Apps	Instrumentation and compensation for aerospace applications	Automotive, industrial, OEM, thermal compensation, thermal management

Digital Output

	TSYS Series NEW
Package	QFN16, TDFN8
Type	I²C, SPI, PWM, SDM (convertible to analog voltage)
Unique Features	–Low power –Small size –Calibrated and ready to use –16 bit resolution
Accuracy	Up to ±0.1°C at -5°C to 50°C
Operating Temp.	-40°C to 125°C
Dimensions (mm)	QFN16: 4 x 4 x 0.85 TDFN8: 2.5 x 2.5 x 0.75
Typical Apps	Industrial control, replacement of precision RTDs, thermistors and NTCs, heating/cooling systems, HVACR

preliminary

Sensing Elements— NTC, RTD, Digital Output

Analog Output

RTD	Platinum Thin Film Chips NEW	Platinum Thin Film Sensors NEW	Glass Wire Wound Sensors	Ceramic Wire Wound Sensors
Package	Leadless chips	Wired component	GO, GX	CWW600, CWW850, CWW1000
Type	–Thin film platinum deposited on ceramic substrate –Contact pads on top and bottom side for NTC chip like assembly –Contact pads on both ends for SMT	–Thin film platinum deposited on ceramic substrate, glass coated –Tube outline available –Connection via radial leads	Glass rod, radial leads	Ceramic rod, radial leads
Resistance Range	100Ω, 1000Ω (Other values on request)	100Ω, 1000Ω (Other values on request)	100Ω (2x100Ω on few versions)	100Ω (2x100Ω on few versions)
Unique Features	–Long term stability –Interchangeability –Assembly like NTC chips –Very small dimensions –Short response time	–Long term stability –Interchangeability –Small dimensions –Short response time –High electrical insulation	–Aggressive environments (acid, oil, solvent) –Small dimensions –Stability –No hysteresis –Short response time –Interchangeability	–High temperature –Stability –No hysteresis –Small dimension –Interchangeability
Accuracy	According to DIN EN 60751	Class T (F0.1), A (F0.15), B (F0.3) according to DIN EN 60751	Class W0.3, W0.15, W0.1 according to IEC60751	Class W0.3, W0.15, W0.1 according to IEC60751
Operating Temp.	-50 °C to 400 °C	-50 °C to 600°C (standard) down to -200 °C or up to 1000 °C (on request)	-200°C to 400°C	-200°C to 600°C (CWW600) -200°C to 850°C (CWW850) -200°C to 1000°C (CW1000)
Dimensions (mm)	1.5 x 1.5 (top / bottom pads) 1.2 x 3.6 (SMT)	2.0 x 2.3 x 1.1 (standard) 1.2 x 4.0 x 1.1 (standard) other dimensions (on request)	Ø 1.8 / Length 5mm to Ø 4.5 / Length 48mm	Ø 1.5 / Length 8 mm to Ø 4.5 / Length 30 mm Ø 2.7 / Length 45 mm (CWW1000)
Typical Apps	White goods, automotive, industrial, aerospace, medical, test and measurement	White goods, automotive, industrial, aerospace, medical, test and measurement	Oil and chemical industry, aviation, aeronautic, food industry	Process industry, laboratories, reference sensors

Sensor Assemblies

	Ring Sensors	Push-in Sensors	Screw-in Sensors	Refrigeration Molded Probes
Package	–Ring for surface assembly –Threaded bolt, tube style	Brass, copper or stainless steel closed-end tube	Brass, copper or stainless steel housing with integrated connector	PVC or TPE
Type	Epoxy potted element	Epoxy potted element, miniature design	Epoxy potted element, rigid sheath	Overmolded
Sensor Range	–NTC –RTD: Pt, Ni	–NTC –RTD: Pt, Ni –Thermocouple: Type J, K, T, E	–NTC –RTD: Pt, Ni, Cu –Thermocouple: Type J, K, T, E	–NTC –RTD: Pt
Unique Features	–Surface mount sensing –For use where space is limited –Simple installation	–Corrosion resistant –Available with mounting tabs or clips	–Corrosion resistant –Different threads types –Connectors available	–Mounting clips available
Accuracy	–NTC: Custom tolerances available –Pt RTD: Class AA, A, B according to IEC60751	–NTC: Custom tolerances available –Pt RTD: Class AA, A, B according to IEC60751	–NTC: Custom tolerances available –Pt RTD: Class AA, A, B according to IEC60751	–NTC: Custom tolerances available –Pt RTD: Class AA, A, B according to IEC60751
Operating Temp.	Varies: -50°C to 250°C	Varies: -50°C to 250°C	Varies: -50°C to 250°C	-40°C to 125°C
Dimensions (mm)	Case specific dimensions	Case specific dimensions	Custom lengths, diameters and threads available	8 x 30, 6.5 x 25, 6 x 50, 6 x 5 x 15
Typical Apps	Surface plates, heat exchangers, fluid pumping systems, generators	Boiler, liquid, evaporator, HVACR, industrial processes control, district heating/cooling, automotive, bearing monitoring, motors, gear boxes	Boiler, liquid, HVACR, industrial processes control, district heating/cooling, immersion	HVACR, industrial processes control

Sensor Assemblies

	Pipe Clamp Sensors	Pipe Mount Sensors NEW	Outdoor Air Sensors NEW	Boiler Sensors
Package	Plastic housing with metal insert	Copper or Stainless Steel housing	Metal housing with PVC sun shield with or without weatherproof box	Brass housing
Type	–Overmolded –Epoxy potted	–Overmolded –Epoxy potted	Fully potted subassembly	Screw
Sensor Range	–NTC RTD: Pt	–NTC	–NTC	–NTC –RTD: Pt, Ni, Cu
Unique Features	–Different pipe diameters available	–Fast response time –Moisture resistant construction	–Easy installation – just threads into mounting hole or standard handy box –Fully potted housing protects sensing element and provides fast, accurate response	–Integrated connector –Corrosion resistant –Different threads types and connectors available
Accuracy	–NTC: Custom tolerances available	–NTC: Custom tolerances available	±0.2°C at 0°C to 70°C	–NTC: Custom tolerances available –Pt RTD: Class AA, A, B according to IEC60751
Operating Temp.	-40°C to 105°C	-40°C to 125°C	-40°C to 105°C	Varies: -50°C to 250°C
Dimensions (mm)	Custom diameters available	Custom configurations available	12mm dia X 64mm	Custom lengths, diameters and threads available
Typical Apps	Pipe surface temperature sensing, HVACR	Industrial process, boiler control, HVACR, refrigeration, food service, energy management, test equipment	Residential and commercial building controls, energy management systems	Boiler control, liquid, industrial processes control, district heating/cooling, immersion

	Oven Sensors	Pool and Spa Sensors NEW	Urea Temperature Sensors NEW	Exhaust Gas Temperature Probes
Package	Stainless steel housing	Plastic or metal housing with O-ring seal designed for band clamp or backing nut	Plastic housing with screw hole mountings	EGT thermocouple probe
Type	–Pt element encapsulated into ceramic tube, with rigid stainless steel housing –High temperature cable	Overmolded sub-assembly	Overmolded plastic housing with integrated 2 pin connector	–Mineral insulated alloy sheath, screwed mechanical interface, cable extension and automotive connector –Option: CAN bus interface (from 1 to 4 thermocouples, fully configurable)
Sensor Range	Pt100, Pt500, Pt1000 sensor	NTC	NTC	Thermocouple: Type K, N
Unique Features	–High temperature –Easy integration/installation –Higher dielectric strength according to type	–O-ring seals –Compatible with pool and spa chemicals	–Temperature measurement of urea liquid used in selective catalytic reduction (SCR) systems –Suitable for high pressure applications	–High temperature, robust design –Vibration and corrosion resistant –Fast response time
Accuracy	Class B, C according to IEC60751	±0.2°C	–NTC: Custom tolerances available –±2%, 3% and 5% –Beta 25/85 : 3976	Class 1 according to IEC584
Operating Temp.	-20°C to 750°C (according to version)	0°C to 90°C	-40°C to 125°C	-40°C to 900°C
Dimensions (mm)	–OD Ø 4 mm to Ø 6 mm –Immersion length 35 mm to 100 mm –Custom mechanical interface and cable length	6.4 x 50mm	Sensor tip 8mm diameter	–Ø OD 4 to Ø OD8 mm –Custom immersion length and cable length
Typical Apps	Drying oven, domestic oven	Pools, hot tubs	Temperature measurement of urea liquid used in SCR systems	Automotive, truck, mining, power unit, racing

Sensor Assemblies

	Micro-Thermocouples	Patient Monitoring Probes	TLH Reference Probe	USB Temperature Probe NEW
Package	–Fine gage thermocouples	Sensor with cable and connector	TLH100 / TLH600	Push-in probe with handle
Type	–Micro sized thermocouple: 44 AWG, 40 AWG, 38 AWG, 36 AWG –Polymer encapsulated or bare junction	Reusable: Skin; 10FR & 12FR GP Disposable: Skin; 9FR & 12FR GP; 12FR, 18FR, 24FR Esoph/Stethoscope; 14FR, 16FR, 18FR Foley Catheter	Rigid protective external sheath of Inconel600 and stainless steel handle, unique internal design to insure stability	–Versatile Push-in probe with stainless steel or Inconel600 sheath and plastic or stainless steel handle –High precision sensing element combined with integrated electronics for signal processing, calibration and USB interface
Sensor Range	Thermocouple Type: T, K	400 Series, 700 Series (Reusable only)	Pt100 sensor	Not applicable due to direct digital output
Unique Features	–Welded or soldered junction –Low profile, fast response –Polyesterimide wire insulation	–Autoclavable reusables –Sterile disposables	–Stability –Provided with calibration report or option of calibration certificate by national committee for accreditation (COFRAC)	–USB conformal interface –Calibrated digital output, recalibration possible on request –Robust design for general purpose applications – Long term stability
Accuracy	Varies by Type: standard, special and custom limits or error available	Probes meet both: EN-12470: ±0.1°C at 25°C to 45°C ISO-80601-2-56: ±0.2°C at 35°C to 42°C	Class B (TLH600), A (LTH100) according to IEC60751	±0.1°C for temperature range -5°C to 55°C ±0.2°C for temperature range -40°C to 160°C Other accuracies on request
Operating Temp.	Varies by Type: Rated up to 240°C	-40°C to 100°C Patient: 0°C to 50°C	-80°C to 350°C (TLH100) -180°C to 600°C (TLH600)	-55 °C to 160 °C for probe tip -40 °C to 85 °C for handle with electronics Other temperature ranges on request
Dimensions (mm)	Varies by thermocouple gauge	Reusable: 3 m cable with sensor Disposable: Sensor <1 m; 3 m reusable adaptor cable	OD Ø 5 x 500 + handle Ø 15 x 100 typical cable length = 2 m	OD Ø 6 x 200 + handle Ø 19 x 100 typical cable length = 2000
Typical Apps	Medical, catheters	Patient monitoring, laboratory	Laboratory, temperature sensors calibration by comparison	Laboratory, mobile research, test and measurement

	Stator Sensors NEW	Surface Sensors NEW	Bearing Sensors NEW
Package	–TPE / CPME –G11 Epoxy glass laminated, Class F or H	–Silicone rubber or polyimide laminated element –SP683	–Copper alloy tip –Stainless steel, isolated stainless steel or epoxy glass case
Type	–Rigid flat / slot sensor –Cable / leadwire options	–Flat, flexible, rectangular sensor –Variety of designs available	–Rigid sheath –Tip sensitive –Cable / leadwire options
Sensor Range	–RTD: Pt, Ni, Cu –Thermocouple: Type J, K, T, E	–RTD: Pt, Ni, Cu –Thermocouple: Type J, K, T, E	–RTD: Pt, Ni, Cu –Thermocouple: Type J, K, T, E
Unique Features	–Extended sensitive length –Single or dual elements –Smackproof design –Calibration available	–Surface sensing for curved or uneven surfaces –Noninvasive, simple installation –Adhesive backing option	–Cut-to-length –Copper tip for fast time response –Assemblies with fluid seal and spring loading –Single or dual elements
Accuracy	RTD: Class A, B according to IEC60751	RTD: Class A, B according to IEC60751	RTD: Class A, B, C according to IEC60751
Operating Temp.	Max. temp: Class F, 155°C Max. temp: Class H, 180°C Available up to 200°C	Varies: -50°C to 200°C Available up to 220°C	Sheath specific, up to 250°C
Dimensions (mm)	Custom dimensions available	Custom dimensions available	Custom lengths Standard sheath diameters: 4.78, 5.46, 6.35
Typical Apps	Monitor temperature between stator coils, electric motors, generators	Chemical and pharmaceutical industry, process industry, laboratory, aerospace, motor end windings of stator coils, generators	Bearing monitoring, electric motors, generators

Sensor Assemblies

	Thermocouple	Transmitter NEW
Package	Screw-in or push-in design with cable extension, connector, or connecting head	Brass, copper and stainless steel housing, flexible sheath with integrated connector.
Type	–Collapsible Mineral Insulated (MI) with alloy sheath (radius ≥ 5*OD) –Flexible cable with plastic or composite insulation –Rigid protection sheath: ceramic, quartz or alloy sheath	–Epoxy potted element –Screw In
Sensor Range	Type T, J, K, N, R, S, B (According to TC type and insulation type)	4-20mA Output
Unique Features	–High temperature and high vibration level (for MI) –Available in small diameters for fast respond time –Grounded or ungrounded or apparent hot junction –Single or multiple measuring points	–Compact, welded design –Highly sensitive and stable –High vibration application –Good waterproof properties
Accuracy	Class 1 according to IEC584	0.5 or 1%FS
Operating Temp.	-40°C to 1700°C (according to TC type and insulation type)	-20°C to 120°C
Dimensions (mm)	–OD Ø0.3 mm to Ø8 mm for MI –Ø0.15mm for smallest flexible cable –Custom dimensions, fittings and cable lengths (from few centimeters to many meters)	–Customer sheath length, thread type –Probe diameter: Ø4.75 mm; Ø5 mm; Ø6 mm; Ø6.35 mm; Ø8 mm
Typical Apps	Aeronautic, process industry, medical, semiconductor industry (spike, profile)	Heavy industry, general industrial monitoring

Thermopiles

	TS Series TS318-3B0814, TS318-5C50, TS305-10C50	TSEV Single Pixel Series	TSEV Multi Pixel Series	TPT Series TPT300V
Package	TO-18, TO-5	OEM-module	OEM-module	IP65 stainless steel tube
Type	Thermopile sensor components	Single-pixel thermopile module	8-pixels-linear array thermopile module	Thermopile system for industrial use
Temp. Range	Depends on applied electronics and calibration, filter types optimal for object temperature range -40°C to 300°C (extended range: -60°C to 1000°C)	Object temperature range 0°C to 300°C Other temperature ranges available upon request	Object temperature range -20°C to 120°C	Object temperature range 0°C to 300°C
Unique Features	–High signal output –Accurate reference sensors	–Calibrated, Interfaces: I^2C, SPI –Different field of views: 5° at 50%, 10° at 50%, 90° at 50%, others on request	–Calibrated and ready to use –Digital output –Small field of view	–Calibrated and ready to use –Digital or analogue outputs –Small field of view
Accuracy	Depends on applied electronics and calibration	Depends on temperature range, typical 1% full scale, max. accuracy 0.1°C	Depends on temperature range, typical 2% full scale	Depends on temperature range, typical 1% full scale
Operating Temp.	Ambient temperature range: -20°C to 85°C	Ambient temperature range: 0°C to 85°C	Ambient temperature range: -20°C to 85°C	Ambient temperature range: 0°C to 85°C
Dimensions (mm)	9 x 9 x 17.6	35 x 25 x 13 to 31	25 x 35 x 15.2	111 x 17 x 17
Typical Apps	Medical thermometer (ear, forehead), pyrometer	Contactless temperature measurement, e.g. on moving parts or heated rolls, laminators, people detection, microwave oven, air conditioner	Contactless temperature measurement, e.g. on moving parts or heated rolls, laminators, people detection, microwave oven, air conditioner	Contactless temperature measurement, e.g. on moving parts or heated rolls, control of assembly lines, paper fabrication, drying applications

humidity

solutions by sensor type

Based on a robust patented capacitive technology, Measurement Specialties offers a complete range of calibrated and amplified products measuring relative humidity. Accurate dew point and absolute humidity measurements are made possible through the combination of relative humidity and temperature measurements. Our products are qualified for the most demanding applications including automotive, heavy truck, aerospace and home appliance. We offer a variety of output signals including digital (frequency, I^2C) and analog voltage, as well as customized and proprietary output including PWM, PDM, LIN and CAN.

Humidity and Temperature (NTC) Components

Analog Output

Digital Output

	HS1101LF	HTU2X Series NEW	HTU2XF Series NEW
Package	Through hole TO39 with side opening plastic cap	DFN type	DFN type
Type	Capacitive humidity	Digital RH and temperature	Digital RH and temperature
Operating RH Range	0 to 100% RH	0 to 100% RH	0 to 100% RH
Operating Temp	-60°C to 140°C	-40°C to 125°C	-40°C to 125°C
Unique Features	–Very robust and recognized component capable of withstanding most of the applications in the humidity world in very cost effective ways	–Low power consumption –Fast response time –Very low temperature coefficient –I²C interface or PWM interface or SDM interface	–Low power consumption –Fast response time –Very low temperature coefficient –I²C interface or PWM interface or SDM interface –Optimal filter
Accuracy	180 pF ±3 pF at55% RH	±3% RH at 25°C (10 to 95% RH) ±0.3°C at 25°C	±3% RH at 25°C (10 to 95% RH) ±0.3°C at 25°C
Dimensions (mm)	10 x 10 x 19	3.0 x 3.0 x 1.0	3.0 x 3.0 x 1.0
Typical Apps	Applications requiring a robust humidity sensor in automotive, home appliance, outdoor, HVACR, consumer, printer, meteorology	Humidity and temperature plug and play transducers for OEM demanding applications in automotive, home appliance, printer, medical, humidifier	Humidity and temperature plug and play transducers for OEM demanding applications in automotive, home appliance, printer, medical, humidifier

Humidity and Temperature (NTC) Mini-Modules

Analog Voltage and Digital Output

	HTU3535PVBM/Wire NEW	HTU383X/Wire NEW	HTG351xCH
Package	Cost effective small size mini-module	Cost effective small size mini-module	Cost effective small size mini-module
Type	Analog voltage RH and NTC temperature	Digital RH and temperature	Analog voltage RH and NTC temperature
Operating RH Range	0 to 100% RH	0 to 100% RH	0 to 100% RH
Operating Temp	-40°C to 110°C	-40°C to 110°C	-40°C to 110°C
Unique Features	–PTFE filter (optional) –Electronics fully protected (5 Volt) –Multiple connector choices (JST, samtec board to board through hole) –Based on HTU21	–PTFE filter (optional) –Electronics fully protected (5 Volt) –Multiple connector choices (JST, samtec board to board through hole) –Based on HTU21	–Electronics fully protected with potting material (3.3 Volt or 5 Volt) –Multiple connector choices (JST, samtec board to board through hole)
Calibration	±3% RH at 55% RH; ±0.25°C at 25°C	±3% RH at 55% RH; ±0.25°C at 25°C	±3% RH at 55% RH; ±0.25°C at 25°C
Dimensions (mm)	27 x 11.9 x YY (depending on the connector, from 6 to 10.8 mm length)	27 x 11.9 x YY (depending on the connector, from 6 to 10.8 mm length)	27 x 11.9 x 6.7
Typical Apps	Humidity and temperature plug and play transducers for OEM demanding applications in HVACR, home appliance, printer, medical, and outdoor	Humidity and temperature plug and play transducers for OEM demanding applications in HVACR, home appliance, printer, medical, and outdoor	Humidity and temperature plug and play transducers for OEM low cost consumer applications

Humidity and Temperature (NTC) Sensors

Frequency Output Systems (Digital)

	HTF3000LF
Package	PCB for Board to Board
Type	Frequency output for RH, direct NTC for temperature
Operating RH Range	0 to 100% RH
Operating Temp	-40°C to 85°C
Unique Features	–Voltage supply from 3 to 8 Vdc –Through hole or SMD –T&R available
Calibration	±3% RH at 55% RH ±0.25°C at 25°C
Dimensions (mm)	12.5 x 18.5 x 11.2
Typical Apps	Passenger comfort improvement, hygrostat, HVACR, printer

Humidity and Temperature (NTC) Probes

Analog Voltage

	HM1500LF	HM1520LF	HTM2500LF
Package	Probe / RH only	Probe / RH only	Probe RH and temperature
Type	Cost effective analog voltage RH probe	Dedicated to low RH accurate measurement	Cost effective analog voltage RH
Operating RH Range	0 to 100% RH	0 to 100% RH	0 to 100% RH
Operating Temp	-40°C to 60°C	-40°C to 60°C	-40°C to 85°C
Unique Features	–Electronics fully protected with potting material –Optional wiring length and connectors	–Electronics fully protected with potting material –Optional wiring length and connectors	–Electronics fully protected with potting material –Optional wiring length and connectors
Calibration	±3% RH at 55% RH	±3% RH at 10% RH	±3% RH at 55% RH ±0.25°C at 25°C
Dimensions (mm)	57 x 11 x 11 (standard wire length of 200 mm)	57 x 11.5 x 11.5 (standard wire length of 200 mm)	86 x 11.5 x 11.5 (standard wire length of 200 mm)
Typical Apps	Medical, telecommunication cabinets, green houses, process control, industrial	Medical, drying cabinets, low humidity, meteorology	Hygrostat, data loggers, baby cabinets

E&V Humidity and Temperature Modules

	H2TG/H2TD Series*	H2TD368x* NEW	HTM2500B6Cy*	HTD2800B11C6*	HTD2610* NEW
Package	Cost effective module for automotive defogging application	Cost effective module for truck defogging application	Engine probe for truck and automotive	TRICAN engine probe for truck and automotive	Engine probe for truck and automotive
Type	–Dew point and windshield temperature measurement –Analog or digital (LIN) output	–Dew point and windshield temperature measurement –LIN output	–Dew point measurement –Analog output	–Temperature, SH, pressure measurement –CAN output	–Dew point measurement –LIN output
Operating RH Range	0 to 100% RH	0 to 100% RH	0 to 100% RH	0 to 100%RH 0 to 150g/Kg	0 to 100% RH
Operating Temp	-40°C to 85°C	-40°C to 85°C	-40°C to 105°C	-40°C to 125°C	-40°C to 125°C
Pressure Range	—	—	—	1 kPa to 115 kPa	—
Unique Features	–Electronics fully protected with potting material	–Optional Bracket and Cover for installation –Electronics fully protected with potting material –12V or 24V power supply	–Electronics fully protected with potting material	–Configurable CAN Frame –Self diagnostic capabilities to comply with J1939, EPA / EURO and CARB requirements	–12V power supply
Calibration	±1.5°DP at 10°C ±0.8°C at 25°C	±1.5°DP at 10°C ±0.8°C at 25°C	±3% RH at 55% RH ±0.8°C at 25°C	SH: ±2.5g/Kg Temp: ±2°C at 25°C Pressure: ±1% FS	±1°DP at 25°C
Dimensions (mm)	27 x 32 x YY (depending on the connector, from 6 to 10.8 mm length)	22 x 43 x 10	70 x 64.5 x 54.5 (integrated connector)	76.3 x 64.3 x 55.9 (integrated connector)	62.24 x 24.0 x 54.0 (integrated connector)
Typical Apps	Fogging and cabin energy control	Fogging and cabin energy control	Humidity and temperature engine control	Emission control application such as NOx control with air intake measurements, engine management	Humidity and temperature automotive passenger car, engine and emission management

* Please consult us for specific request

flow

solutions by sensor type

Measurement Specialties manufacturers Mass Air Flow (MAF) sensors for a variety of Automotive, Medical and Industrial Gas Flow applications where reliable and accurate measurements are specified. They are typically mounted in a well-defined channel, directly in the flowing media. Our Flow Switches are designed for water control, power shower, central heating systems, circulation pump protection, cooling and leak detection. They feature reed switch reliability and are easily installed. Suitable for hot and cold potable water, these sensors have rugged brass housings and operate from a small head of water.

NEW

Mass Air Flow Sensors

Flow Switches

For Direction of Liquid and Gas Flow

	LMM-H03	LMM-H04	FS-01	FS-02	FS-05	FS-06	FS-90/1
Package	Hybrid	Hybrid	Noryl	Noryl	Brass	Brass	Copper
Type	–Hot Film Anemometer Component –Bi-Directional	–Hot Film Anemometer Component –Uni-Directional	–Flow switch	–Flow switch	–Flow switch	–Flow switch	–Flow switch
Max Pressure	—	—	10 Bar at 20°C	10 Bar at 20°C	10 Bar at 20°C	10 Bar at 20°C	10 Bar at 20°C
Operating Temp	-40°C to 125°C	-40°C to 125°C	-30°C to 85°C	-30°C to 85°C	-30°C to 100°C	-30°C to 100°C	-30°C to 85°C
Unique Features	High sensitivity at low heater temperatures, fast response time, true air temperature sensor	High sensitivity at low heater temperatures, fast response time, true air temperature sensor	SPST reed switch, normally open, close on flow	Triac, normally open, close on flow	SPST reed switch, normally open, close on flow	Triac, normally open, close on flow	SPST reed switch, normally open, close on flow
Calibration / Accuracy	Dependent on electronics	Dependent on electronics	N/A	N/A	N/A	N/A	N/A
Dimensions (mm)	23 x 10.15 x 1.1	24 x 10.15 x 1.1	106 x 32 x 32	106 x 32 x 32	113 x 53 x 36	113 x 53 x 36	153 x 25 x 15
Typical Apps	Air intake of combustion engine, spirometer, industrial gas flow	Air intake of combustion engine, spirometer, industrial gas flow	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems	Mains water control, power shower, central heating systems, circulation pump protection, cooling systems	Leak detection, flow sensing, mains water control, cooling systems, circulation pump protection

position

solutions by sensor type

Measurement Specialties is a leading manufacturer of industrial linear and angular position, tilt and fluid level sensors. Both off-the-shelf and custom position sensing solutions are available featuring our core technologies including inductive, potentiometric, magneto-resistive, Hall effect, reed switch, electrolytic and capacitive sensing. Sophisticated designs and state-of-the-art manufacturing techniques provide reliable and cost effective solutions for a broad range of applications. MEAS applications range from automotive, power generation, subsea, hydraulics, medical, HVACR, process controls, factory automation, security systems and many other industrial areas, to the most severe environments in Military/Aerospace and Nuclear. Measurement Specialties position sensors are available with analog and digital outputs. Our comprehensive range of signal conditioning instrumentation allows us to meet the specific needs of both OEMs and end users.

Anisotropic Magnetoresistive (or AMR) Sensor Components

Magnetoresistive

Anisotropic magnetoresistive or AMR sensors offer robust non-contact measurement of changes in the angle of the magnetic field as seen by the sensor. This effect allows for the creation of sensors that can detect disturbance in extremely weak fields, as found in traffic detection sensors, to strong field sensors that are used in precision encoders.

	KMY, KMZ	MS32	KMT32B	KMT36H	MLS	KMA36 NEW
Package	SOT-223, E-line 4 pin	TDFN 2.5 x 2.5	TDFN 2.5 x 2.5, SO-8	TDFN 2.5 x 2.5	Die, hybrid	TSSOP
Type	Linear low field sensor	Low field switch sensor	Angle sensor	Angle sensor	Linear displacement sensor	Angle sensor
Range	-2 to +2 kA/m magnetic field	1 to 3 kA/m magnetic switching field	180° angle	360° angle	Absolute within pole pitch, else incremental	360° angle
Unique Features	–High sensitivity –Low hysteresis –Linear to uniaxial field strength	–Linearized ratiometric output –Temperature compensated switching point	–High accuracy –High resolution	–High accuracy –High resolution –360° full turn	–For pole pitch –MLS-1000: p=1 mm –MLS-2000: p=2 mm –MLS-5000: p=5 mm	–Low cost MR encoder for rotational and incremental measurements
Output	Ratiometric with output voltage range 20 mV/V	Ratiometric with output voltage range 10 mV/V	Sine / cosine signals with output voltage range 20 mV/V	Three 120° phase shifted output signals with output voltage range 20 mV/V	Sine / cosine signals with output voltage range 20 mV/V	Voltage 0 - 5 V I^2C Customer specific
Resolution	Typ. 0.1% of range	Typ. 0.1 kA/m	Typ. 0.01° to 0.1°	Typ. 0.01° to 0.1°	0.01% to 0.1% of pole pitch	Typ. 0.1°
Accuracy	Typ. 1.0% of range	Typ. 0.1 kA/m	Typ. 0.1° to 1.0°	Typ. 0.1° to 1°	0.1% to 1.0% of pole pitch	Typ. 0.3°
Operating Temp	-40°C to 150°C	-25°C to 85°C	-40°C to 150°C (175°C on request)	-40°C to 150°C	-40°C to 125°C	-25°C to 85°C
Dimensions (mm)	SOT: 6.6 x 7.0 x 1.6 E-line: 16 x 4.2 x 2.4	TDFN: 2.5 x 2.5 x 0.8	TDFN: 2.5 x 2.5 x 0.8 SO-8: 5 x 4 x 1.75	TDFN: 2.5 x 2.5 x 0.8	Die: 5.2 x 1.2 x 0.5 HK: 7.6 x 5.3 x 1.4 HS: 18 x 8 x 2	TSSOP20: 6.5 x 6.4 x 1.2
Typical Apps	Non-destructive material testing, spray arm detection in dish washers, magnetic imaging, brake pedal position	Piston position switch, reed switch replacement	Steering position, flow meters, rpm meters, rotary encoders	Steering position, gauge readings, rotary encoders	Roller conveyors, circular saws, bending machines etc.	Knobs, small robotics, angular / linear position

Angular Position Transducers, Inductive

Absolute

Measurement Specialties offers many different OEM and end-user, non-contact angular position solutions. We have a technology for virtually any automotive, industrial or mil-aero application. Absolute angular technologies include RVDT and RVIT, with outputs and packaging to match most application requirements.

	RVIT-Z	R60D	R30A
Package	PCB for OEM volumes	Servo mount with ball bearing	Servo mount with ball bearing
Resolution	Infinite	Infinite	Infinite
Excitation	DC Voltage	DC symmetrical ±15 VDC	AC operated
Output	DC voltage, DC current, digital	±7.5 VDC	AC voltage
Range	Up to ±75°	±60°	±30° to ±60°
Unique Features	–Absolute position	–Absolute position –Low momentum of inertia	–Absolute position
Operating Temp	-25°C to 85°C	-25°C to 85°C	-55°C to 150°C
Dimensions (mm)	Custom	Aluminum case size 11 (Ø 27 mm)	Aluminum case size 11 (Ø 27 mm)
Typical Apps	Viscometers, valve position, robotics, HVACR vane position, ATM's, joysticks	Dancer arm position, rotary actuator position feedback, throttle lever position feedback, ballvalve position, textile manufacturing equipment, printing presses	Machine tool equipment, rotary actuator feedback, valve positioning, power generation valve position

Other models available, Please consult MEAS web site library.

Angular Position Sensors, Encoders

Absolute

Measurement Specialties designs and manufactures many absolute and incremental angular encoders based on our Magneto Resistive and Rotary Hall Effect technology. These encoders are designed to OEM specifications or standard off-the-shelf. Outputs are either analog or digital and we also have submersible packages.

	ED-18	ED-22	R36 NEW
Package	Medium duty with sleeve or ball bearing	Medium duty with sleeve bearing	Heavy duty shaftless
Resolution	Analog 1.4°	Analog 1.4°	Analog 0.7°
MAX Speed	300 RPM (sleeve bearing) 3000 RPM (ball bearing)	300RPM	—
Excitation	5 Vdc	5 Vdc	5 Vdc
Unique Features	–Low profile –Excellent stability –No optical degradation	–Encapsulated electronics / sealed unit –Highly resistant to vibration –No optical degradation	–Rugged housing –Shaftless –No optical degradation
Output	Voltage or current	Voltage	Voltage
Range	360°	270°	180°
Operating Temp	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	25.4 x 25.4 x 33.78	Ø 19.05 x 38.1	38.1 x 25.4 x 7.62
Typical Apps	Feedback sensor or human machine interface device, servomotor position and speed control	Low-cost non-contact HMI potentiometer replacement	Feedback sensor or human machine interface device, rudder control, servomotor position and speed control

Absolute

	H005 / H009 Series NEW	H009–1200 Series NEW Dual Output
Package	–12.7 mm - 22.19 mm / .500 in - .875 in housing diameter –3.170 mm / .1248 in shaft diameter –16.9 mm - 17.4 mm / .670 in - .680 in housing length	–22.23 mm / .875 in housing diameter –3.170 mm / .1248 in shaft diameter –26.1 mm / 1.03 in housing length
Range	up to 359 degrees	up to 359 degrees (dual output)
Output Options	Analog / PWM / Serial	Analog / PWM / Serial
Resolution	12 Bit - Analog / PWM 14 Bit - Serial	12 Bit - Analog / PWM 14 Bit - Serial
Linearity	± 0.2%	± 0.2% (dual output)
Nominal Supply	5 volts	5 volts (dual output)
Operating Temp	-40°C to 150°C	-40°C to 150°C
Rotational Life	> 100 million cycles (bearing life)	> 100 million cycles (bearing life)
Typical Apps	Critical position feedback apps in commercial, industrial, medical, aircraft and military markets	Critical position feedback apps in commercial, industrial, medical, aircraft and military markets

Incremental

	ED-19	ED-20
Package	Medium duty with sleeve or ball bearing	Medium duty with ball bearing
Resolution/ Accuracy	1024, 400, 256 CPR (others on request)	1024, 400, 256 CPR (others on request)
MAX Speed	300 RPM (sleeve bearing) 3000 RPM (ball bearing)	3000 RPM
Excitation	5 Vdc	5 Vdc (NPN and LVD) 12 - 32 Vdc (HVD)
Unique Features	–Sleeve or ball bearing –No optical degradation	–Resistant to contamination –Metallic threaded bushing mounting –Custom housings, shafts, connectors available –No optical degradation
Output	Quadrature (TTL level, open collector)	Quadrature (NPN, LVD and HVD)
Range	360°	360°
Operating Temp	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	25.4 x 25.4 x 33.78	Ø 31.75 x 33.78
Typical Apps	Feedback sensor or human machine interface device, servo/stepper motor position and speed control	Feedback sensor or human machine interface device, servo/stepper motor position and speed control

Other models available, please consult MEAS website library.

Tilt Sensors

Single Axis

Measurement Specialties offers both capacitive and electrolytic tilt sensing technology in rugged die-cast aluminum or ceramic packaging. These products are available in ranges up to ±240 degrees and are provided with many analog as well as digital I/O options. Linearized and temp-compensated outputs are available. OEM and end-user packaging is available as well as raw sensors for high volume OEM applications.

	E-Series	**AccuStar®**	**APS System**	**G-Series**	**AccuStar® IP66**	**IT9000** NEW
Package	Ceramic housing	LCP housing	Plastic housing	AL housing IP 67	AL housing IP 66	Aluminum or stainless
Type	Inclination sensor module	Inclination sensor module	Inclination system	Inclinometer	Inclinometer	Inclinometer
Range	±5°, ±15°	±45° to ±60°	±20°, ±45°, ±90°	±10°	±3° to ±45°	±45° to ±240°
Output	Voltage	Voltage	Analogue / digital	Switch	Current	Voltage divider, 4 - 20 mA
Unique Features	–Easy to handle –Minimal temperature drift –Good long term stability	–Compact –Low power –Vertical and horizontal mount	–Stand alone system –Separate system and sensor	–Programmable –EMC standard –High switch accuracy	–EMI + RFI rated –CE pending –Water tight enclosure	–Rugged industrial design, IP67 / 68 –Submersible –Designed for brutal environments –CSA, CENELEC certification for hazardous area applications
Accuracy	±0.2° to ±0.5°	0° to 10° ±0.1% accuracy 10° to 45° ±1% of reading	0° to 10° ±0.1% accuracy 10° to 45° ±1% of reading	±0.25°	0° to 10° ±0.1% linearity 10° to 45° ±1% linearity	±0.04% to ±0.25%
Operating Temp	-25°C to 85°C	-30°C to 65°C	-25°C to 65°C	-25°C to 85°C	-25°C to 60°C	-34°C to 90°C
Dimensions (mm)	29 x 17 x 16.5	65.91 x 51.56 x 30.5	127.5 x 88 x 32.2	80 x 75 x 57.5	98.04 x 63 x 35.05	Ø 130 x 100
Typical Apps	Road construction, building monitoring, weighing systems, mobile and stationary cranes, platform leveling	Wheel alignment, construction, equipment, antenna positioning, robotics, crane / boom angle	Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment	Lift platforms, building device control, train inclination monitoring, position switch	Tower crane safety, RV and mobile trailer leveling, water and oil well drilling rigs, mining equipment	Waste water control, tainter gates, draw bridges, heavy industrial applications

Dual Axis

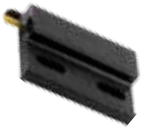
All of the same features of the Measurement Specialties' single axis sensors and modules in a dual axis package.

	DPL/DPN-Series	**DOG2-Series** NEW	**DPG-Series**	**D-Series**
Package	PCB board	Plastic PA 6.6 housing, IP 67	AL housing IP 67	AL housing IP 67
Type	Inclination board module	Inclinometer	Inclinometer	Inclinometer
Range	±2° to ±30°	±25°, ±45°, ±90°	±5° to ±30°	±5° to ±30°
Output	Voltage / RS 232 / SPI	Voltage / Current / J1939	RS232 / Voltage	RS232 / Voltage / Current / Switch / PWM / CAN open
Unique Features	–High resolution –Minimal temperature drift –User configurable	–Plug & play –Wide measurement range –Cost-efficient –Cable with Tyco Amp connector –Fast MEMS sensor	–CE approved –Rugged housing –Easy to use –User configurable	–High accuracy –Rugged housing –Programmable –CE approved
Accuracy	±0.05° to ±0.8°	< ± 0.5° (full temp. range)	±0.3°	±0.04° to ±0.8°
Operating Temp	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	45 x 45 x 14	70.5 x 45 x 15	84 x 70 x 30.2	84 x 70 x 46
Typical Apps	Laser leveling, weighing systems, mobile and stationary cranes, hydraulic leveling, building monitoring, wind power	Off-road vehicle, fork lift, truck leveling, man lift, harvester, farm machine, tip over protection, solar panel control	Platform leveling, road construction machines, tunnel drilling, mobile leveling	Drilling machines, mobile and stationary cranes, wind power, antenna / radar leveling

Proximity Sensors

Proximity Sensing When Used with a Proximity Magnet

NEW



	PS2011AB	PS2021AB	PS2031AB	PS501	PS801	PS811	PS831
Package	Glass filled nylon 6.6	Glass filled nylon 6.6	Glass filled nylon 6.6	Glass filled nylon 6.6	Stainless steel	Nylon 6.6	Stainless steel
Type	Proximity sensor	Proximity sensor	Proximity sensor	Proximity sensor	Proximity sensor	Proximity sensor	Proximity sensor
Unique Features	SPST reed switch, normally open	SPST reed switch, normally closed	SPDT reed switch	SPST reed switch, normally open	SPST reed switch, normally open	SPST reed switch, normally open	SPST reed switch, normally open
Operating Temp	-30°C to 105°C	-30°C to 105°C	-30°C to 105°C	-30°C to 130°C	-30°C to 120°C	-30°C to 110°C	-30°C to 130°C
Dimensions (mm)	29 x 7 x 20	29 x 7 x 20	29 x 7 x 20	Ø 6 x 32	Ø 12 x 65	Ø 10 x 38	Ø 12 x 32
Typical Apps	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication

Proximity Magnet

Proximity Magnet for Use with Proximity Sensors

NEW

	PM101	PM50	PM81	PM83
Package	Glass filled nylon 6.6	Glass filled nylon 6.6	Nylon 6.6	Stainless steel
Type	Proximity magnet	Proximity magnet	Proximity magnet	Proximity magnet
Unique Features	Housed magnet	Housed magnet	Housed magnet	Housed magnet
Operating Temp	-30°C to 105°C	-30°C to 70°C	-30°C to 120°C	-30°C to 120°C
Dimensions (mm)	29 x 7 x 20	Ø 6 x 32	Ø 10 x 38	Ø 12 x 32
Typical Apps	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication	Door interlocks, hook switches, security systems, safety interlocks, position indication

Linear Position Transducers

NEW

Cable Extension Transducers

Commonly called stringpots or draw-wire sensors, cable extension transducers provide a linear position feedback signal for both short and long stroke measurement ranges. These sensors have been designed to provide the utmost in flexibility, long life and high accuracy. The benefits of string pots are that they are easy to install, don't require precise alignment and the retractable spring loaded measuring eliminates the need for the extra space required by most rod-type position sensors.

	M150, MTA	MT2, MT3	SM, SP	SG, SR	Z115, Z250
Range	0 - 1.5 to 0 - 5 inches	0 - 3 to 0 - 30 inches	0 - 2.5 to 0 - 50 inches	0 - 80 to 0 - 175 inches	0 - 100 to 0 - 2400 mm
Output	Voltage divider	Voltage divider, incremental encoder	Voltage divider, 0 - 10 Vdc, 4 - 20 mA	Voltage divider, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA, incremental encoder, CANbus	Voltage divider
Environment / IP Rating	IP50	IP50, IP67 (MT3A)	IP50	IP67	IP50
Enclosure	Aluminum	Aluminum and polycarbonate	Polycarbonate with stainless steel bracket	Polycarbonate with stainless steel bracket	Aluminum
Accuracy	±0.4% to ±1%	±0.25% to ±1.1%	±0.25% to ±1%	±0.35% to ±0.5%	±0.15% to ±0.25%
Unique Features	–M150, world's smallest stringpot –Designed for space-critical and testing applications	–designed for test applications –Dual-axis measuring cable alignment –Tracks high-acceleration linear position up to 136g's –High-frequency response –GAM EG 13 certification	–In stock –Compact design –Low cost, high value stringpot –Versatile stainless steel mounting bracket –Free-release tolerant –Custom configurations available for OEM customers	–In stock –Low cost, high value stringpot –Versatile stainless steel mounting bracket –Simple one-button user scalable stroke range (SR) –Custom configurations available for OEM customers	–Customer specific for OEM applications –Short design time –Fast turnaround –Cost effective –Contact factory for more information
Operating Temp	-40°C to 85°C (M150) -55°C to 100°C (MTA)	-55°C to 125°C	-18°C to 70°C	-40°C to 85°C	Design specific
Dimensions (mm)	19 x 19 x 10 (M150)	55 x 45 x 55	43 x 45 x 68	100 x 120 x 200	Design specific
Typical Apps	Aerospace, automotive instrumentation, crash testing, auto and motorcycle racing	Automotive crash testing, aerospace and flight testing	Factory automation, light industrial, seismic testing, racing instrumentation, medical imaging systems, fume hood position	Outdoor mobile construction equipment, outrigger positioning, hydraulic lifts, water and power controls	Vehicle lift systems, medical imaging systems including x-ray, mammography, CT's and oncology devices, fume hood and HVACR controls

	PTX, PT101	PT1, PT5	PT8000	PT9000
Range	0 - 2 to 0 - 100 inches	0 - 2 to 0 - 250 inches	0 - 2 to 0 - 60 inches	0 - 75 to 0 - 1700 inches
Output	Voltage divider, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA, incremental encoder, velocity output (DV301)	Voltage divider, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA, incremental encoder, CANbus, DeviceNet, RS-232	Voltage divider, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA, incremental / absolute encoder, CANbus, DeviceNet, RS-232	Voltage divider, 0 - 5 Vdc, 0 - 10 Vdc, 4 - 20 mA, incremental / absolute encoder, CANbus, DeviceNet, RS-232
IP Rating	IP50	IP65, IP67 (PT5)	IP67, IP68	IP67, IP68
Enclosure	Aluminum	Aluminum and abs plastic (PT1)	Aluminum or stainless	Aluminum or stainless
Accuracy	±0.04% to ±0.25%	±0.04% to ±0.25%	±0.04% to ±0.25%	±0.04% to ±0.25%
Unique Features	–Original classic design –High precision –Proven track record	–Designed for most factory environments –Industry standard output signals –User serviceable –Compact design (PT1)	–Heavy duty, submersible –Designed for extreme industrial and marine environments –CSA, CENELEC certification for hazardous area applications –High accuracy, high acceleration –Free-release proof with VLS option –M12 and Deutsch connector options	–Heavy duty, submersible –Proven workhorse for long stroke applications –Designed for extreme industrial and marine environments –CSA, CENELEC certification for hazardous area applications –Free-release proof with VLS option –M12 and Deutsch connector options
Operating Temp	-40°C to 90°C	-40°C to 90°C	-40°C to 90°C	-40°C to 90°C
Dimensions (mm)	Model and range specific	85 x 100 x 70 (PT1) 100 x 175 x 80 (PT5)	90 x 140 x 135	200 x 135 x 125
Typical Apps	Aerospace testing, architectural and structural testing, factory automation	Factory automation, industrial, die casting, injection molding	Steel mills, lumber and paper mills, factory automation, die-casting, injection molding, mobile construction and mining	Mobile hydraulic boom position, water resource management, mining and tunnel boring equipment, telescoping mechanism position, theatre stage control

Linear Position Transducers, Inductive

Absolute

Linear absolute technologies include LVDT's for OEM and end-user applications and LCIT's for low-cost OEM requirements. All of these sensors feature friction-free, non-contact inductive magnetic coupling for extremely long cycle life and virtually infinite resolution. Various off-the-shelf and custom packaging options are available for the most demanding application requirements.

	HR	M12	HC	XS-C	DC-SE	XS-D
Package	AISI-400 Series Stainless steel	AISI-304 Series Stainless steel	AISI-400 Series Stainless steel	AISI-304 Series Stainless steel	AISI-400 Series Stainless steel	AISI-400 Series Stainless steel
Linearity	±0.25% of range	±0.25% of range	±0.25% of range	±0.25% of range	±0.25% of range	±2% of range
Excitation	AC operated	AC operated	AC and DC operated versions	AC operated	8.5 to 28 VDC	AC operated
Output	AC voltage	AC voltage	AC or DC voltage, 4 - 20 mA loop or RS-485	AC voltage	0 - 5 VDC (4 wire) 1 - 6 VDC (3 wire)	AC voltage
Range	±0.05 to ±10 inches	±10 to ±100 mm	±0.05 to ±10 inches	±0.25, ±0.5 & ±1 inch	0 - 0.1 to 0 - 6 inches	±1 to ±10 inches
Unique Features	–Large bore to core clearance –Broad range of excitation frequencies –Many options –Mild radiation resistance option	–Metric series –High stroke to length ratio –Constant sum of secondaries –Excellent temperature coefficient	–Hermetically sealed –Welded connector –Double shielding –Intrinsically safe version –CE mark for DC versions	–High pressure –Bulkhead mounting –Hermetically sealed welded assembly	–CE mark –Low current consumption (6 mA typical) –Synchronous demodulation –Shielded cable	–Very high stroke to body length ratio
Operating Temp	-55°C to 150°C (220°C optional)	-55°C to 150°C (220°C optional)	-55°C to 150°C (AC); 0°C to 70°C (DC)	-55°C to 150°C	-25°C to 85°C	-55°C to 150°C
Diameter (mm)	20.6	12	19	19	19	20.6
Typical Apps	General industrial	Hydraulic spool valve position feedback, flight simulators, aircraft flight control feedback	Harsh environments, submersible applications, process controls, valve position feedback	Hydraulic actuators, other pressurized vessels	Positioning sensing feedback, battery operated systems, test labs, ram guide, platen position	Where sensor installation length is restricted, ideal replacement for linear potentiometers

Other models available, please consult MEAS web site library.

Dimensional Gauging Products

Gage heads are spring loaded or air actuated position sensors (LVDTs) with contact tips. Our precision gauge heads are classified into several categories based on size, repeatability, accuracy and input/output.

	LBB, spring-extend	LBB air-extend	PCA 375	GC	Ultimate-Precision Digital LBB NEW
Linearity	±0.2% of range	±0.2% of range	±0.5% of range	±0.25% (Voltage) to ±0.5% (4 - 20 mA) of range	Accuracy ±0.2%
Excitation	AC operated	AC operated	AC operated	AC or DC voltage	5 VDC USB (bus or external)
Output	AC voltage	AC voltage	AC voltage	AC or DC voltage, RS-485, or 4 - 20 mA loop	RS485; USB
Range	±0.02 to ±0.20 inches	±0.04 & ±0.1 inches	±0.02 to ±1 inches	±0.05 to ±2 inches	1, 2, 5 and 10 mm
Unique Features	–0.000004 inch (0.1 µm) repeatability –Removable tungsten carbide contact tip –Double shielded LVDT –Repairable	–0.000004 inch (0.1µm) repeatability –Removable tungsten carbide contact tip –Double shielded LVDT –Repairable	–Longer strokes –IP65 cable exit –Accepts industry standard contact tips –Heavy duty return spring	–Hermetically sealed –Welded MS connector (MIL-C-5015) –CE mark for DC Versions –Special tips available –Air extend spring retract available	–Plug-and-play –14-bit resolution –COM libraries provided –CE mark –USB adapter and power supply available
Operating Temp	-40°C to 70°C	-40°C to 70°C	-20°C to 70°C	-55°C to 150°C (AC); 0°C to 70°C (DC)	0°C to 60°C
Diameter (mm)	8 or 9.5	8 or 9.5	9.5	19 mm body, 1/2 - 20 threads	Stackable gage system
Typical Apps	Process standards, manufacturing on-line inspection, robotics, replaces dial indicators in manual measurement systems	Process standards, manufacturing on-line inspection, robotics, replaces dial indicators in manual measurement systems	High density gaging fixtures, resistance weld verification, pressing applications, X-Y stage position feedback, rough casting inspection	Harsh environments, environments requiring hermetic seal, high temperatures (150°C for AC units)	Multi-channel electronic dimensional gauging, precision dimensional measurement, optics inspection systems, SPC data collection, hand tools

Other models available, please consult MEAS web site library.

Linear Position Encoders

Incremental

Linear incremental encoders provide rugged low cost, non-contacting position feedback for demanding applications. This technology is not affected by dirt, oil, dust or other contaminants. It is also not affected by changes in ambient lighting conditions.

ED32i

NEW

Package	IP67 aluminum
Range	Magnetic scale, 5mm pole pitch, typically up to 100 m absolute version up to 100 mm range on request
Excitation	5 VDC
Output	5 V TTL ABZ differential quadrature; RS-485
Resolution	≥ 10 µm; field programmable
Maximum Speed	4 m/s
Unique Features	–Contactless incremental measurement –Very high accuracy, programmable resolution –High speed up to 4 m/s –Error detection, missing scale function –Adapter plate for easy mounting
Operating Temp	-25°C to 85°C
Dimensions (mm)	60 x 20 x 10
Typical Apps	Linear displacement measurement in industrial and medical applications

Potentiometers

NEW

Linear Position Sensors

MLP, CLP

Package	Aluminum body, steel rod, IP65 / 67
Range	0 - 0.5 to 0 - 11.5 inches
Excitation	Up to 40 VDC max.
Output	Voltage divider
Resolution	±0.1% to 0.5%
Maximum Speed	10 m/s
Unique Features	–Extended temperature range, miniature design –First choice for auto racing applications –Perfect for high cycle applications
Operating Temp	-40°C to 90°C
Dimensions (mm)	Diameter / Cross Section: Ø 9.5 mm (MLP), 15 mm x 15 mm (CLP)
Typical Apps	Vehicle testing, autosport instrumentation, structural and architectural testing and robotics.

5903 / 5905 Series

Linear Motion

Package	–7.94 mm - 12.7 mm / .312 in - .500 in housing diameter –1.98 mm - 3.18 mm / .078 in - .125 in shaft diameter
Resistance	1K / 5K / 10K
Range	5903 series - up to 50.8 mm / 2 in stroke 5905 series - up to 101.6 mm / 4 in stroke
Linearity	±1%
Output Smoothness	<0.1%
Resolution	Infinite
Operating Temp.	-65°C to 125°C
Rotational Life	50 million cycles min
Typical Apps	Critical position feedback apps in commercial, industrial, medical, aircraft and military markets

Potentiometers

Angular Position Sensors

NEW

6000 Series
Servo Mount

Package	–12.7 mm - 50.8 mm / .500 in -2.00 in housing diameter –3.170mm - 6.34mm / .1248 in - .2498 in shaft diameter –12.7mm - 1.74mm / .500 in -.680 in housing length –11.11mm - 47.62mm / .438 in - 1.875 in mounting pilot diameter
Resistance	1K - 20KΩ
Range	up to 355 degrees
Linearity	± 0.5%
Output Smoothness	<0.1%
Resolution	Infinite
Operating Temp.	-65°C to 125°C
Rotational Life	50 million cycles min
Typical Apps	Critical position feedback apps in commercial, industrial, medical, aircraft and military markets

6200 Series
Bushing Mount

Package	–12.7 mm - 50.8 mm / .500 in -2.00 in housing diameter –3.170mm - 6.34mm / .1248 in - .2498 in shaft diameter –12.7mm - 1.74mm / .500 in -.680 in housing length –3/8 32 NEF thread / 10.31mm / .4062 in pilot diameter
Resistance	1K - 20KΩ
Range	up to 355 degrees
Linearity	± 0.5%
Output Smoothness	<0.1%
Resolution	Infinite
Operating Temp.	-65°C to 125°C
Rotational Life	50 million cycles min
Typical Apps	Critical position feedback apps in commercial, industrial, medical, aircraft and military markets

6900 Series
Element/Wiper/Insul

Package	–17.81 mm - 45.85mm / .702 in -1.805 in element outside diameter –4.724 mm - 11.05mm / .186 in - .435 in element inside diameter –3.175 mm -6.35 mm / .125 in - .250 shaft insulator inside diameter –4.064 mm - 7.80mm / .160 in - .307 in mating wiper inside diameter –5.08 mm / .200 in assembled package height
Resistance	1K / 5K / 10KΩ
Range	up to 350 degrees
Linearity	± 0.5%
Output Smoothness	< 0.1%
Resolution	Infinite
Operating Temp.	-65°C to 125°C
Rotational Life	50 million cycles min
Typical Apps	Critical position feedback apps in commercial, industrial, medical, aircraft and military markets

6100 Series
Hollow Shaft

Package	–27.94 mm - 66.5 mm / 1.100 in - 2.62 in housing diameter –3.175 mm - 19 mm / .125 in - .752 in hollow shaft diameter
Resistance	1K - 20KΩ
Range	up to 355 degrees
Linearity	± 0.5%
Output Smoothness	< 0.1%
Resolution	Infinite
Operating Temp.	-65°C to 125°C
Rotational Life	50 million cycles min.
Typical Apps	Critical position feedback apps in commercial, industrial, medical, aircraft and military markets

RT8, RT9

NEW

Package	Aluminum or stainless IP67, IP68
Resolution	±0.15% to ±1.25%
MAX Speed	—
Excitation	—
Unique Features	–Absolute rotary –Designed for heavy industrial applications –CSA, CENELEC certification for hazardous area applications
Output	Voltage divider, 0 - 5V, 0 - 10V, 4 - 20 mA, incremental encoder, CANbus, DeviceNet™
Range	0 - 0.125 to 0 - 200 turns
Operating Temp	-40°C to 90°C
Dimensions (mm)	Ø 65 x 100 (RT8) Ø 115 x 60 (RT9)
Typical Apps	Valve control, airport passenger loading bridge, water management, factory automation

LVDT / RVDT Instrumentation

Our OEM and end-user oriented LVDT/RVDT instrumentation signal conditioners and read-out devices are specifically designed to be compatible with all our Linear and Angular AC inductive sensors. These instruments provide everything needed to interface with our AC devices to control or data acquisition systems.

	LVM-110 LiM-420	**LDM-1000**	**ATA-2001**	**PML 1000**	**MP 2000**
Package	Open circuit board	DIN rail mount	1/8 DIN panel mount	1/8 DIN panel mount	1/4 DIN panel mount
Supply	DC voltage	10 to 30 VDC	115 and 220 VAC, 50 - 400 Hz	90 to 265 VAC, 50 - 60 Hz or 24 VDC	100 to 240 VAC, 47 - 63 Hz
Output	DC voltage or current	DC voltage and current	DC voltage and current	DC voltage and current (RS-485 optional)	DC voltage and RS-232
Operating Temp	0°C to 55°C	-25°C to 85°C	-40°C to 85°C	10°C to 55°C	0°C to 55°C
Unique Features	–Master / slave for multi-up applications –Dip switch selectable excitation frequencies –Plug-in PCB or wire termination –Small form factor	–Operates with 4, 5 & 6 wire LVDT / RVDTs –Adjustable zero, span and phase –Status LEDs –CE mark	–Push button programmable –Splash proof front panel –LED status lights –Mounting hardware included –CE mark	–5 digit LED display –Auto-calibration –Programmable –Splash proof front panel –Mounting hardware included –CE mark	–Programmable set point controller –Dual channel with math functions –Digital I/O –Large LCD display –Splash proof front panel
Dimensions (mm)	63 x 56 x 21	115 x 99 x 23	267 x 99 x 49	173 x 97 x 49	178 x 92 x 92
Typical Apps	OEM applications	Automotive test track instrumentation, gas and steam turbine controls, factory automation	Precision metrology labs, power generation valve position monitoring	Remote monitoring stations, measurement test stands, process monitoring	LVDT based weighing systems, pass / fail parts sorting, quality inspection

liquid level

solutions by sensor type

Measurement Specialties' range of liquid level products addresses the sensing requirements of the construction, off-road, automotive industries. Our solutions include level sensors for power steering, coolant, windscreen wash, fuel and oil. We pride ourselves on our experience in serving the heavy duty vehicle markets: Truck and Bus, Emergency, Military, Recreational, Luxury and Coach.

We also offer level sensors for use in demanding applications such as storage and collection tanks, vending machines, showers for the disabled, heat exchangers, washing machines, central heating systems and boilers.

To meet the requirements of the food and beverage industry, MEAS offers a range of standard products which provide cost-effective solutions. We also provide thousands of sensors annually to marine engine manufacturers.

For complex OEM applications, we work closely with customers to ensure the appropriate sensing solution is delivered.

Liquid Level Sensors

High or Low Level Sensing

NEW

	LS304-31	LS304-51N	LS309-31	LS309-51N	LS504-31	LS504-51
Package	Glass filled nylon 6.6	Glass filled nylon 6.6	Glass filled nylon 6.6	Glass filled nylon 6.6	Glass filled PPS	Glass filled PPS
Type	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor
Unique Features	SPDT reed switch	SPDT reed switch	SPST reed switch	SPST reed switch	SPDT reed switch	SPDT reed switch
Max. Pressure	2.0 bar	4.7 bar	2.0 bar	4.7 bar	2.0 bar	4.7 bar
Operating Temp	-30°C to 130°C	-30°C to 130°C	-30°C to 130°C	-30°C to 130°C	-30°C to 110°C	-30°C to 110°C
Dimensions (mm)	103 x 29 x 29	88 x 27 x 27	103 x 29 x 29	88 x 27 x 27	103 x 29 x 29	88 x 27 x 27
Typical Apps	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Chemical high or low level, diesel fuel, fuel low level, alcohols, low oil detection	Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water	Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water

	LS509-31	LS509-51	LS804-31	LS804-51	LS809-31	LS809-51
Package	Glass filled PPS	Glass filled PPS	Glass filled polypropylene	Glass filled polypropylene	Glass filled polypropylene	Glass filled polypropylene
Type	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor	Level sensor
Unique Features	SPST reed switch	SPST reed switch	SPDT reed switch	SPDT reed switch	SPST reed switch	SPST reed switch
Max. Pressure	2.0 bar	4.7 bar	2.0 bar	4.7 bar	2.0 bar	4.7 bar
Operating Temp	-30°C to 110°C	-30°C to 110°C	-30°C to 105°C	-30°C to 105°C	-30°C to 105°C	-30°C to 105°C
Dimensions (mm)	103 x 29 x 29	88 x 27 x 27	103 x 29 x 29	88 x 27 x 27	103 x 29 x 29	88 x 27 x 27
Typical Apps	Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water	Coolant level indication, water high or low level, boiler heating element protection, drinking water level, boiling water	Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems	Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems	Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems	Continuous 80°C in water, water high or low level, condensate level alarm, drinking water level, cooling systems

ultrasonic (air bubble, point level, continuous level monitoring)

solutions by sensor type

Measurement Specialties' range of level sensors is now expanded to include sensors using Ultrasonic Technology.

Using ultrasonic technology opens a wider variety of applications where liquid level needs to be measured despite transparency, viscosity, color or dielectric. Our ultrasonic sensors are deployed in numerous applications including, air bubble detection in as small as 1mm tube, contact and non-contact and high accuracy for container fill verification through air and liquid, 316L stainless steel sensor material construction for pump protection and non-invasive solutions for pipeline fluid/type detection.

To meet the requirements of our customers level applications, MEAS offers a range of standard products which provide a system with no moving parts, no adjustments, no maintenance, robust and cost-effective reliable level sensing solution. With ranges in temperature from -240°C to 288°C, pressures to 1000 psi, various input/output configurations and multiple sensing points, MEAS also provides sensors annually for custom complex OEM applications and works closely with customers to ensure the appropriate sensing solution is delivered.

Visit our website or call us for the special point level and custom sensors.

Ultrasonic Sensors

NEW

Standard Contact Point Level

	LL-01	LL-10	LL-100	LL-101
Type	Gap	Tip	Tip	Gap
Unique Features	–All 316L SS –Integral electronics –Miniature threads –Single machined –No adjustment for viscosity, density	–All 316L SS –Integral electronics –No adjustment for viscosity, density	–All 316L SS –Integral electronics –No adjustment for viscosity, density	–High / normal fail-safe –Integral electronics –Plastic for chemical compatibility –No adjustment for viscosity, density –Demand self-test
Input	6 - 24VDC	9 - 24VDC	DC and AC options	DC and AC options
Output	1/2A contact	1A SPDT	10A DPDT or analog	10A DPDT
Pressure	250 psi	1000 psi	1000 psi	1000 psi
Temperature	100°C	100°C	150°C	150°C
Actuation point	0.25"	2.25" standard	Custom	Custom
Process Connection	1/4"NPT & 1/2"NPT	3/4"NPT	3/4"NPT	3/4"NPT
Cable	12"	12"	Terminal block	Terminal block
Approvals	CE	CE	CE	CE
Typical Apps	Medical waste tanks, histology processors, compressors, chillers, coolant reservoirs	Hydraulic reservoirs, storage tanks, pipe lines, sewage systems	Industrial tanks, pump protection, hydraulic supply lines, storage tanks	Food processing tank, chemical tanks, oil & fuel level, liquid pharmaceuticals

Ultrasonic Sensors

NEW

Air-Bubble and Non-Invasive Point Level

	AD-101	SL-630
Type	Non-invasive	Non-invasive
Unique Features	–Bubble detection from 1mm tube –Temperature option –Occlusion option –Fluid differentiation –3.3 & 5 V input option	–Stick on dry contact –Point level detection
Input	6 - 24 VDC standard	6 - 24 VDC
Output	Open collector	Open collector
Pressure	—	—
Temperature	—	70°C
Actuation point	—	Variable
Process Connection	—	Reusable sensor Disposable tape
Cable	12"	12"
Approvals	CE	CE
Typical Apps	Infusion pumps, dialysis machines, apheresis, auto-transfusion	Chromatography, chemical analyzer, hemodialysis, reagent vessels

Contact Multi-Point Level

	SL-900
Type	Contact
Unique Features	–Miniature –10 URA electro-polished finish –316 LSS body
Input	Variable
Output	Duel LED 1/2 A.N.O. Contact
Pressure	250 PSIG
Temperature	-20°F to 200°F (Sensor)
Actuation point	Variable
Process Connection	3/4 " VCR 1/2" Standard
Cable	Shielded with strain relief and 9 pin connector
Approvals	NEMA 1 housing
Typical Apps	Pharmaceutical and semiconductor industries, high pressure vessels

Continuous Level

	2 Wire	4 Wire	LL-1101	SL-700	ML Series
Type	Continuous transmitter through air	Continuous transmitter through air	Continuous transmitter through air	Continuous transmitter through liquid	Continuous transmitter through air
Unique Features	–Non-contact –Integral electronics –Explosionproof –316 SS or ETFE sensor material –BCD switch program	–Non-contact –Integral electronics –Explosion proof –316 SS or ETFE sensor material –BCD switch program	–Non-contact –Remotely mounted –316 SS or ETFE sensor material –Push button program	–Contact –Remotely mounted –316 SS sensor –RS-232 program	–Non-contact –Remotely mounted –316 SS or Epoxy sensor material –RS-232 program
Input	18 - 30 VDC	24 VDC	DC and AC options	24 VDC	24 VDC
Output	Loop power, 4 - 20 mA	4 - 20 mA isolated	Analog, display, relay setpoints	RS-232, analog, relay setpoints	RS-232, analog, relay setpoints
Pressure	100 psi	100 psi	100 psi	250 psi	Atmosphere
Temperature	82°C	82°C	82°C	100°C	40°C
Sensing Range	6" to 120" - 3/4"NPT 12" to 300" - 2" NPT	6" to 120" - 3/4"NPT 12" to 300" - 2" NPT	6" to 120" - 3/4"NPT 12" to 360" - 2" NPT	Range up to 36"	Range up to 6"
Process Connection	3/4"NPT, 2"NPT	3/4"NPT, 2"NPT	3/4"NPT, 2"NPT	—	—
Accuracy	0.25% of full scale	0.25% of full scale	0.25% of full scale	± 0.005"	± 0.0075"
Elect Connection	Terminal block	Terminal block	Terminal block	Terminal block	Terminal block
Approvals	CE	CE	CE	—	—
Typical Apps	Liquid level monitoring, unstable chemicals, fuel storage tanks, flammable liquids	Food processing, pharmaceutical tanks, high purity fluid tanks, chemical storage	Large storage tanks, factory automation, process control tanks, power plants	Semiconductor tanks, ampoules & bubblers, high purity fluids, level in vacuum	Microplate well level, test tubes & vials, bottle fill level, surface flaw detection

vibration

solutions by sensor type

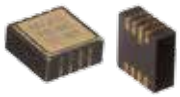
Measurement Specialties brings more than twenty years of experience in the design and manufacture of accelerometers and gyros based on our proprietary Micro-ElectroMechanical System (MEMS), bonded gage and piezoelectric ceramic/film technologies.

Voltage mode piezoelectric is the most popular accelerometer design due to its high level output and its wide bandwidth. We offer voltage mode accelerometers in the traditional 3-wire or 2-wire (IEPE) configurations. Charge mode piezoelectric accelerometers are designed for measuring shock and vibration in high temperature environments. In addition to its high temperature operating capability when used with a high quality charge amplifier, a charge mode accelerometer offers its users unmatched dynamic range scalability. To measure motion (velocity, displacement) accurately, an accelerometer or gyro sensor with DC response is required. Incorporating state-of-the-art MEMS technologies and the latest analog and digital ASICs, Measurement Specialties' DC accelerometers and gyros offer the best-in-class performance and exceptional value. All products are EAR99, RoHS compliant and meet CE standards.

MEMS DC Accelerometers

Embedded

Uses patented piezoresistive silicon die technology with high over-range protection and broad frequency response.



	3022/3028	3052A/3058A	3038	EGHS-M	3255A
Package	Pins or pads	Pins or pads	SMD	SMD	SMD
Type	Board level	Board level	Board level	Board level	Board level
F.S. Range (g)	±2, 5, 10, 20, 50, 100, 200	±2, 5, 10, 20, 50, 100	±50, 100, 200, 500, 2000, 6000	±20K	±25, 50, 100, 250, 500
Unique Features	–mV output –Gas damping –Pin or pad option	–Temperature compensated –Gas damping –Pin or pad option	–Hermetically sealed –High over-range protection –Gas damping	–Low power –Hermetically sealed –>100 kHz resonant frequency	–Self test enabled –Gas damping –Bi-directional mounting
Accuracy	±0.5% Non-linearity	±0.5% Non-linearity	±0.5% Non-linearity	±2.0% Non-linearity	±1.0% Non-linearity
Operating Temp	-40°C to 125°C	-40°C to 125°C	-54°C to 125°C	-55°C to 125°C	-40°C to 125°C
Dimensions (mm)	22.86 x 15.24 x 5.33	22.86 x 15.24 x 5.33	7.62 x 7.62 x 3.3	7.62 x 7.62 x 3.3	13.46 x 7.62 x 3.81
Typical Apps	Vibration / shock monitoring, tilt applications, motion control, impact testing	Vibration / shock monitoring, tilt applications, motion control, impact testing	Vibration / shock monitoring, embedded systems, shock testing, safe and arm	Impact and shock testing, fuzing, safe and arm	Vibration / shock monitoring, aerospace testing, impact testing, transportation

Piezoelectric Accelerometers

Embedded Single Axis

Uses piezo-electric technology with broad frequency response for harsh applications.

Embedded Triaxial

	805/805M1	808/808M1 NEW	810M1 NEW	LDTC Family	832/832M1	834/834M1
Package	TO - 5	TO - 8	Board level	Piezo Film elements with or without mass and pins	SMD	SMD
Type	Adhesive (Stud mount option)	Adhesive (Stud mount option)	SMD	Cantilever beam with vertical or horizontal pins	Board mount	Board mount
F.S. Range (g)	±50, 500 / ±20, 200	±10, 50 / ±4, 20	±25, 100	±10 (typical)	±25, 50, 100, 200, 500	±2000, 6000
Unique Features	–Hermetically sealed –Case grounded design –Bandwidth to 12 kHz	–Hermetically sealed –Case grounded design –Bandwidth to 8 kHz	–Small size, low cost –Dynamic response –6kHz bandwidth	–Very low cost –High sensitivity (1V/g) –Ultra-low power (self generating)	–Low cost –Hermetically sealed –Piezo-ceramic	–Low cost –Hermetically sealed –Piezo-ceramic
Accuracy	±1.0% Non-linearity	±1.0% Non-linearity	±2.0% Non-linearity	±20.0% (typical)	±2.0% Non-linearity	±2.0% Non-linearity
Operating Temp	-50°C to 100°C	-50°C to 100°C	-40°C to 125°C	-40°C to 70°C	-20°C to 80°C / -40°C to 125°C	-20°C to 80°C / -40°C to 125°C
Dimensions (mm)	Ø 8.9 x 10.16	Ø 15.2 x 16.6	12.70 x 15.24	19.05 x 6.35 x 6.35	18.8 x 14.22 x 4.32	18.8 x 14.22 x 4.32
Typical Apps	Machine monitoring, data loggers, permanent structures	Machine monitoring, data loggers, embedded applications	Data logging, impact detection	Wake-up switch, load imbalance, antitheft devices, impact sensing, vital signs monitoring	Data logging, asset monitoring, impact monitoring	Data logging, asset monitoring, impact monitoring

DC Accelerometers

Plug and Play, Unamplified

Uses piezoresistive MEMS technology with high over-range protection and application-specific packaging.

	40A/40B NEW	**52F**	**52/52M30**	**64B/64C**	**58** NEW	**1201/1201F**
Package	Anodized aluminum	Anodized aluminum	Plastic / anodized aluminum	Anodized aluminum	Anodized Aluminum	Anodized aluminum
Type	Screw mount	Screw mount	Adhesive mount	Screw mount	Adhesive mount	Adhesive / screw mount
F.S. Range (g)	±25, 100, 250, 500, 1000, 2000	±50, 200, 500, 2000	±50, 200, 500, 2000	±50, 100, 200, 500, 2000, 6000	±50, 100, 200, 500, 2000	±50, 100, 200, 500, 1000
Unique Features	–Critically damped –SAE J211 / 2570 compliant –Compact	–Low cost –Gas damping –Over-range stops	–Low cost –Gas damping –Over-range stops	–SAE J211 / 2570 compliant –Flexible, rugged cable –Over-range stops	–Low noise cable –Small package –Light weight	–Small size –Flexible, rugged cable –Over-range stops
Accuracy	±1.0% Non-linearity	±1.0% Non-linearity	±1.0% Non-linearity	±1.0 % Non-linearity	±1.0% non-linearity	±1.0 % Non-linearity
Operating Temp	-20°C to 80°C	-40°C to 90°C	-40°C to 90°C	-40°C to 121°C	-20°C to 85°C	-20°C to 85°C
Dimensions (mm)	16.7 x 10.0 x 5.0	11.2 x 10.2 x 3.8	9.65 x 4.83 x 3.3	12.19 x 4.83 x 4.83	14.0 x 6.35 x 6.35	8.89 x 8.89 x 9.4
Typical Apps	In-dummy and pedestrian crash testing	Vibration / shock monitoring, shock testing, safety impact testing, side-impact testing	Vibration / shock monitoring, shock testing, safety impact testing, side-impact testing	In-dummy crash and impact testing	Crash testing, impact testing, off-road testing	On-vehicle crash and impact testing, vibration and shock monitoring

DC Accelerometers

Plug and Play, Unamplified

Uses piezoresistive MEMS technology with high over-range protection and application-specific packaging.

	3801A	**3700**	**EGAXT**	**EGCS-D0 EGCS-D1S**	**EGCS-S425**
Package	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Anodized aluminum
Type	Stud mount	Screw mount	Adhesive / screw mount	Screw / stud mount	Screw mount
F.S. Range (g)	±2, 10, 20, 50, 100, 200, 500, 2000	±50, 200, 500, 2000, 6000	±5 through 2500	±5 through 10,000	±50, 100, 250, 500, 1000, 2000
Unique Features	–Hermetically sealed sensor –Gas damping –10,000 g over-range protection	–No zero shift –mV output –20,000 g over-range protection	–Sub-miniature –Lightweight –10,000 g over-range protection	–Rugged housing –Critically damped –10,000 g over-range protection	–Critically damped –Compact- Mechanical stops
Accuracy	±0.5% Non-linearity	±2.0% Non-linearity	±1.0 % Non-linearity	±1.0 % Non-linearity	±1.0 % Non-linearity
Operating Temp	-54°C to 121°C	-54°C to 121°C	-40°C to 120°C	-40°C to 120°C	-20°C to 80°C
Dimensions (mm)	15.88 x 15.24	14.22 x 8.13 x 3.81	7.2 x 4.6 x 4.6	D0: 19.05 x 19.05 x 7.62 D1S: 12.7 x 12.7 x 15.24	14.73 x 9.9 x 4.83
Typical Apps	Impact testing, structural testing, test and instrumentation, environmental testing	Impact and shock testing, structural testing, drop testing, aerospace testing	Flight test and control, launch, crash, impact testing, robotics	General purpose, machine control, destructive testing, engine testing	Auto safety testing for side impact, on-vehicle, sled and in-dummy

DC Accelerometers

Plug and Play, Amplified

Uses silicon MEMS technology with digital temperature compensation.

	201	4000A/4001A	4602/4604HT	4610/4610A	4801A	4807A NEW
Package	Anodized aluminum	Anodized aluminum	Anodized aluminum	Anodized aluminum	Stainless steel	Stainless steel
Type	Screw mount	Screw mount	Screw mount	Screw mount	Stud mount	Screw mount
F.S. Range (g)	±2, 5, 10, 20, 30, 50, 100	±2, 5, 10, 20, 50, 100, 200	±2, 10, 30, 50, 100, 200, 500	±2, 10, 30, 50, 100, 200, 500	±2, 10, 20, 50, 100, 200, 500, 2000	±2, 5, 10, 20, 30, 50, 100, 200, 500
Unique Features	–Low noise –Low current consumption –2 pole electronic filtering	–Integral connector option –Gas damping –Low power	–Exceptional temp compensation –HT version to 170°C –High overrange –Hermetically sealed	–New low noise ranges –Temperature compensation –High overrange –Hermetically sealed	–Hermetically sealed sensor –Integral connector –Signal conditioned	–Ultra low noise –Micro-g resolution –Hermetically sealed –Detachable cable
Accuracy	±1.0% Non-linearity	±1.0% Non-linearity	±1.0% Non-linearity	±1.0% Non-linearity	±1.0% Non-linearity	±1.0% Non-linearity
Excitation Voltage	5 - 30 Vdc	8 - 32 Vdc	8 - 36 Vdc / 8 - 18 Vdc (HT)	8 - 36 Vdc	8 - 36 Vdc	8 - 18 Vdc
Operating Temp	-40°C to 125°C	-20°C to 85°C	-54°C to 170°C (HT)	-40°C to 115°C	-55°C to 125°C	-55°C to 125°C
Dimensions (mm)	25.4 x 21.59 x 9.65	18.54 x 18.54 x 8.64	21.08 x 21.59 x 7.62	21.59 x 25.4 x 7.62	13.33 x 20.83	18.54 x 18.54 x 8.64
Typical Apps	Motorsports, seismic, wind turbine, structural monitoring	Low frequency monitoring, transportation, vibration monitoring, motion control	Flight testing on engines, flutter test, weapons development	Rail motion control, modal analysis, flight test, structural test	Impact testing, structural testing, test and instrumentation, environmental testing	Seismic, structural monitoring, flight testing, trains, machine control, road test

DC Accelerometers

Plug and Play, Triaxial

Uses silicon MEMS technology.

	EGAXT3	53/53A	63/68CM1	4630/4630A	4020/4030 NEW	606M1
Package	Stainless steel	Anodized aluminum	Stainless steel	Anodized aluminum	Molded plastic	Nitrile rubber pad
Type	Stud mount	Adhesive mount	Screw mount	Screw mount	Screw mount	Removable
F.S. Range (g)	±5 through 2500	±50, 200, 500, 2000	±500, 1000, 2000	±2, 5, 10, 30, 50, 100, 200, 500	±2	±25
Unique Features	–Sub-miniature –Lightweight –10,000 g over-range protection	–Low cost –Gas damping –Low power	–World SID (68CM1) –Gas damping –Low power	–New low noise ranges –Temperature compensated –High overrange –Hermetically sealed	–Low cost –Biaxial, with triaxial option –DC response –Rugged construction	–0.7 damping ratio –Triaxial, hermetic –Seat pad accelerometer –606M2 IEPE option
Accuracy	±1.0% Non-linearity	±1.0% Non-linearity	±1.0% Non-linearity	±1.0% Non-linearity	±1.0% Non-linearity	±1.0% Non-linearity
Operating Temp	-40°C to 120°C	-20°C to 85°C	-20°C to 85°C	-40°C to 115°C	-40°C to 85°C	-20°C to 85°C
Dimensions (mm)	12.7 x 12.7 x 12.7	18.29 x 13.21 x 7.11	12.7 x 12.7 x 12.7	26.16 x 26.16 x 23.37	71.2 x 40.0 x 15.2	199 x 4
Typical Apps	Flight test, crash, shock monitoring	Auto safety, passenger comfort, transportation, NVH analysis	Auto safety, in-dummy crash, on-vehicle crash	Road testing, motion control, structural testing	Structural monitoring, seismic array, bridge testing	Off-road equipment, amusement rides, commercial aircraft

DC Accelerometers

NEW

Plug and Play

	XL403A	XL403D	13203CC	3420XA	3520XA
Package	Anodized aluminum	Anodized aluminum	Anodized aluminum	Anodized aluminum	Anodized aluminum
FS Range (g)	any from ±1 to 15	any from ±1 to 15	±1 to 15	±1 to 500	±1 to 500
Number of Axes	1, 2, or 3	1, 2, or 3	1	Triaxial	1, 2, or 3
Unique Features	–Quick ship –Configurable g range and bandwidth –Performance over temperature	–Quick ship –Digital output –Built-in analyses –User configurable settings	–IdentiCal™ interchangeable sensor –Best performance over temperature –Expanded environmental tests	–Analog output –Precision aligned –Performance over temperature	–Digital output –Direct to PC –User configurable settings
Accuracy	±0.1% Non-linearity	±0.1% Non-linearity	±0.06% Non-linearity	±0.2% Non-linearity	±0.2% Non-linearity
Excitation Voltage	8.5 to 36 VDC	8.5 to 36 VDC	8.5 to 36 VDC	8.5 to 36 VDC	8.5 to 36 VDC
Operating Temp	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	36.50 x 25.40 x 17.50	36.50 x 25.40 x 17.50	24 x 24 x 27.30	24 x 24 x 28.30	52 x 36.50 x 17.50
Typical Apps	Flight test, wind turbine, flight simulator	Non-navigation heading, system monitor, test and measurement	Aircraft warning system, railway mechanism, test and measurement	Safety system, research & development, test and measurement	Device production systems, impact detection, test and measurement

Charge Mode, Piezoelectric Accelerometers

Plug and Play

Uses piezoelectric technology with broad frequency response for harsh applications.

	7500A	7501A	7502A	7508A	7514A NEW	7530A
Package	Stainless steel	Titanium	Titanium	Stainless steel	Stainless steel	Hard anodized aluminum
Type	Through hole mount	Through hole mount	Adhesive mounting	Adhesive mounting	Stud mounting	Screw mounting
Sensitivity (pC/g)	20, 13, 7	5.6	1.8	5.6	100, 50, 30, 20, 13	5.6
Unique Features	–Single axis, shear mode –Hermetically sealed –Isolated mounting surface –Wide bandwidth	–Single axis, shear mode –Hermetically sealed –Bandwidth to >15 kHz	–Single axis, shear mode –Hermetically sealed –<1 gram –Wide bandwidth	–Single axis, shear mode –Hermetically sealed –Bandwidth to 8 kHz	–Single axis, shear mode –>12 kHz bandwidth –High sensitivity	–Triaxial, shear mode –Hermetically sealed –Isolated mounting surface –Wide bandwidth
Operating Temp	-73°C to 260°C	-73°C to 260°C	-73°C to 260°C	-73°C to 260°C	-73°C to 260°C	-73°C to 200°C
Dimensions (mm)	8.38 x 22.35	5.84 x 14.48	4.40 x 11.94	9.53 x 10.16	14.99 x 14.99	18.72 x 18.72 x 11.68
Typical Apps	Gearbox vibration monitoring, flight test, high temp applications	Gearbox vibration monitoring, flight test, high temp applications	Small structures monitoring, minimal mass loading, high temp applications	Small structures monitoring, general purpose, high temp applications	Low frequency vibration, general purpose, high temp applications	Vibration monitoring, drop testing, high temp applications

Voltage Mode, Piezoelectric (IEPE) Accelerometers

Plug and Play

Uses piezo-electric technology with broad frequency response for harsh applications.

	7100A/7101A	7109A/B NEW	7108A	7104A/7105A NEW	7131A/7132A NEW	7120A/7122A
Package	Stainless steel / titanium	Stainless steel	Stainless steel	Stainless steel	Titanium	Titanium
Type	Through hole mounting	Stud mount	Adhesive mounting	Stud mounting	Adhesive/stud mounting	Adhesive mounting
Sensitivity (mV/g)	100, 10, 5	50, 1.0, 0.5, 0.25	100, 10	100, 50, 10, 5	100, 50, 10, 5, 2.5	1000, 100, 10
Unique Features	–Single axis, shear mode –Isolated mounting surface –Hermetically sealed –Wide bandwidth, >10 kHz	–Single axis, shear mode –High g shock –Integral cable –Rugged construction	–Single axis, shear mode –Wide bandwidth –Welded construction –Small size	–Single axis, shear mode –Wide bandwidth –Top and side connector option	–Triaxial, shear mode –>12 kHz bandwidth –4-pin connector –Hermetically sealed	–Single axis, shear mode –Miniature cube –10-32 connector –Hermetically sealed
Operating Temp	7100A: -55°C to 150°C 7101A: -55°C to 125°C	-55°C to 125°C	-55°C to 125°C	-55°C to 125°C	-55°C to 125°C	-55°C to 125°C
Dimensions (mm)	7100A: 9.9 x 22.35 7101A: 5.84 x 14.48	15.1 x 10.0	9.53 x 10.16	7104A: 11.11 x 14.10 7105A: 11.11 x 19.05	7131A: 11 x 11 x 11 7132A: 15.24 x 20.32 x 13.46	10.16 x 10.16 x 19.16
Typical Apps	Flight testing, general purpose, vibration monitoring	Shock testing, impact monitoring, drop testing	Vibration monitoring, modal testing, general purpose	General purpose IEPE accel, vibration monitoring, lab testing	General purpose, modal testing, vibration monitoring	Modal testing, vibration monitoring, small structures monitoring

Voltage Mode, Piezoelectric Accelerometers

Plug and Play

Uses piezoelectric technology with broad frequency response for harsh applications.

	7202A/7204A	8042 NEW	8011/ 8021-01 NEW	8032-01 NEW	8011/ 8021-AR/AP NEW	8011/ 8021-VR/VP NEW
Package	Stainless steel	Titanium	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Type	Through hole mount	Stud mount	Stud / through hole mount	Stud mount	Stud / through hole mount	Stud / through hole mount
Sensitivity (mV/g)	100,10	500, 100, 10	500, 100, 10	100, 10	4 - 20 mA RMS or peak	4 - 20 mA RMS or peak
Unique Features	–Annular shear mode –Integral strain relief –Case isolated, internally shielded –3-pin connector –150°C option	–Industrial applications –Submersible –IP68, >100 meters –16kHz bandwidth	–Industrial accelerometer –Case isolated, internal shielding –Reverse wiring protection –±1.0% Non-linearity	–Industrial accelerometer –Case isolated, internal shielding –Low cost –Molded strain relief	–Industrial accelerometer –Case isolated, internal shielding –50, 20, 10, 5 g ranges	–Velocity transmitter –Case isolated, internal shielding –0.5 to 5.0 in/sec
Operating Temp	-55°C to 130°C	-20°C to 80°C	-55°C to 125°C	-55°C to 100°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	13.34 x 19.05	22.23 x 48.26	22.23 x 48.26	14.3 x 45.3	22.23 x 48.26	22.23 x 48.26
Typical Apps	HUMS applications, machinery monitoring, harsh environments	Submersed pump monitoring, underwater research, gearbox monitoring	Industrial applications, machine monitoring, intrinsic safety	Industrial applications, machine monitoring	Industrial applications, machine monitoring, intrinsic safety	Industrial applications, machine monitoring, intrinsic safety

Gyros, Angular Rate Sensors

NEW

Plug and Play

	GY407D	11206AC	11207AC	3120XB	65210E
Package	Anodized aluminum	Anodized aluminum	Anodized aluminum	Anodized aluminum	Anodized aluminum
FS Range (°/s)	±300	±50, 180, 300, 600	±250, 300, 450	±50, 150, 300, 600, 1000, 1200	up to ±20K on roll axis
Number of Axes	1, 2, or 3	Single axis	Single axis	Triaxial	Six
Unique Features	–Digital output –Built-in analyses –Dynamic interface –Performance over temperature	–IdentiCal™ interchangeable sensor –Best performance over temperature –Gain and offset compensation –Expanded environmental tests	–IdentiCal™ interchangeable sensor –High stability –Low noise –Vibration-rejecting	–Performance over temperature –Rugged packaging –Power supply regulation –Temperature calibration data	–Complete 6DoF and TM kit –External inputs –User configurable –Self-powered
Accuracy	±1.0% Non-linearity	±0.1% Non-linearity	±0.01% Non-linearity	±0.1% Non-linearity	up to ±0.1% Non-linearity
Excitation Voltage	8.5 to 36 VDC	8.5 to 36 VDC	10 to 36 VDC	8.5 to 36 VDC	8.5 to 36 VDC
Operating Temp	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Dimensions (mm)	36.50 x 25.40 x 17.50	24 x 24 x 27.30	24 x 24 x 27.30	24 x 24 x 28.30	69.85 dia x 201.42 length
Typical Apps	Non-navigation heading, vehicle dynamics, test and measurement	Wind turbine, weapons testing, test and measurement	Wind turbine, weapons testing, test and measurement	Weapons testing, boat stabilization, test and measurement	Weapons separation testing, captive carry testing

Electronics

Signal Conditioners

Easy-to-use instrumentation that ensures data integrity.

	121 NEW	130 NEW	140/142 NEW	161
Type	Bench top	Inline charge converter	Auto-zero inline amplifier	Bench top
# of Channels	3	1	1	4
Gain Range	0.001 to 9999	0.1, 1, 10	10, 25, 50, 100, 200, 500	0.001 to 999.9
Unique Features	–Universal DC amplifier –Low noise operation with auto-zero –For bridge type sensors –µP controlled, Programmable –Low-pass filter options	–Low noise –Small package –Wide bandwidth –BNC male or female	–±1.5mV auto-zero –For bridge type sensor (140) –For strain gage (142) –Lowest noise –5 to 30Vdc excitation	–Charge and IEPE conditioner –Sensitivity normalization –LCD display –Support IEEE 1451.4 TEDS –10 V peak linear output –Selectable LP filter
Dimensions (mm)	301 x 258 x 102	Ø13.8 x 52.2	56.9 x 25.4 x 12.7	310 x 180 x 115
Typical Apps	Instrumentation labs, test benches, R&D facilities	Instrumentation labs, high temperature testing PE accelerometer	Instrumentation labs, test benches, R&D facilities	Instrumentation labs, PE/IEPE sensors

photo optic

solutions by sensor type

The MEAS line of Photo Optic Sensors includes both photo optic components and complete sensor solutions. Our component series features dual LED, bi-wavelength emitters and spectrally paired photo detectors. MEAS optics are ideally suited for medical applications for which the selection of peak wavelength is a priority, such as pulse oximetry (SpO_2). We also package our optics into complete probe assemblies for pulse oximetry (SpO_2) monitoring applications. The MEAS OEM pulse oximetry (SpO_2) probe platform includes reusable finger clips, soft silicone boots, and a range of disposable sensors.

Photo Optic Sensors

Photo Optic Components and Pulse Oximetry Probe Platforms

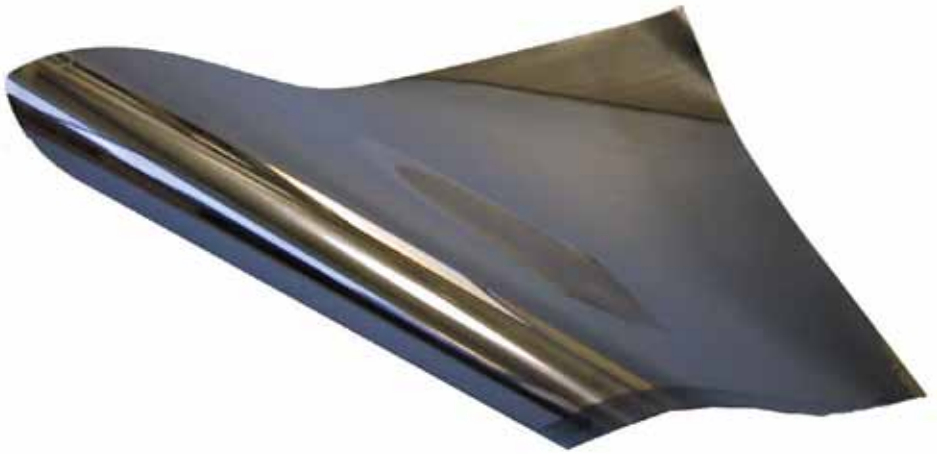
	ELM-4000	EPM-4000	Disposable Sensor	Finger Clip Sensor	Soft Sensor
Package	Lead frame	Lead frame	Biocompatible	Biocompatible	Silicon boot
Type	Emitter assembly	Detector assembly	Sensor platform	Sensor platform	Sensor platform
Range	660 nm / 880-940 nm		Adult / neonatal	Adult	Adult / pediatric
Unique Features	–Low cost –Dual drive –Clear epoxy lens	–Low cost –Fast response –High efficiency	–Latex free –Lightweight –Microfoam / cloth	–Soft pads –Lightweight –Easily cleaned	–Ease of use –Lightweight –Latex free
Accuracy	Sensor dependent	Sensor dependent	Sensor dependent	Sensor dependent	Sensor dependent
Operating Temp	-55°C to 70°C	-55°C to 70°C	-55°C to 70°C	-55°C to 70°C	-55°C to 70°C
Dimensions (mm)	4.4 x 5.1 x 1.9	4.4 x 5.1 x 1.8			
Typical Apps	Pulse oximetry, finger/ear probes, disposable	Pulse oximetry, finger/ear probes, disposable	Pulse oximetry	Pulse oximetry	Pulse oximetry

piezo film

solutions by sensor type

Piezoelectric fluoropolymer film produces voltage or charge proportional to strain. Exceptionally high strain sensitivity (15 mV/με), in-plane strain bandwidth from <0.1 Hz to >100 kHz, ultrasound transmit and receive functionality to >100 MHz, and dynamic range of 280 dB characterize the very unique capabilities of Piezo Film. A highly versatile, enabling sensor technology, Piezo Film has thin cross-section (28 μm - 110 μm in thickness), is flexible, very robust, chemically inert and can withstand temperatures up to 85°C (125°C with special processing). Piezo Film is also pyroelectric, capable of generating >8V/°C. Simple printing with conductive ink defines the active electrode areas. This may be easily customized to give either single elements or complex arrays.

Piezo Cable is a coaxial sensor utilizing piezo film as the sensing material. Available in continuous lengths of 1km or longer, Piezo Cable possesses many of the attributes of Piezo Film in an extremely rugged and shielded form factor that is easy to deploy.



	DT1 & SDT1	Piezo Cable	CM-01	FLDT1	LDTC Analog PCB
Package	Unshielded element with twisted pair or shielded element with shielded cable	Shielded coaxial 20 gage piezo cable	Metallized plastic housing	Unshielded film element with screen printed leads	Evaluation PCB platform for vibration sensor
Type	Flexible film, adhesive mount	Polymer jacketing; armored jacketing	Contact microphone	Flexible film, adhesive mount	Amplified analog output
Range	15 mV/με up to 1% strain	μPa sensitivity	40 V/mm; 8 Hz to 2.2 kHz	15 mV/με, up to 1% strain	1 Hz to 117 Hz
Unique Features	–Thin, flexible, robust –Withstands up to 1% strain –Ultra-low power (self generating)	–Continuous lengths to 1km –Shielded construction	–Low noise –Vibration and impact sensing –High sensitivity	–Thin, flexible –Leads screen printed on film –Connects to standard connector	–Low power –High sensitivity –Analog and digital signal access points
Accuracy	±20% (typical)	±20% (typical)	N/A	±20% typical	±20%
Operating Temp	-40°C to 70°C (up to 125°C available)	-40°C to 85°C (up to 100°C available)	5°C to 60°C	-40°C to 70°C; higher available custom	-20°C to 85°C
Dimensions (mm)	Application dependent	3 mm diameter; continuous lengths	18 dia x 11 high	12 x 30 active; custom available	33 x 46
Typical Apps	Dynamic strain gage, contact microphone, acoustic pickup	Perimeter and fence security; geophone, impact sensors, intrusion detection, seat occupancy (e.g. airbag), patient bed vital signs monitor	Electronic stethoscope, contact microphone, vibration and impact sensing	Event timing, dynamic strain, motion detection	Vibration sensing, wake-up sensor, activity sensor

	Laboratory Amplifier	80 KHz Transducers	NDT-1	Tamper Box	ACH01	LDTC Family
Package	Bench top	Pin mounted	Adhesive mounted	Flat film or box mounted	Ceramic base, plastic cover, shielded cable	Piezo film elements with or without mass and pins
Type	Piezo film lab amp	Air ultrasound transducer	High frequency ultrasound transducer	Tamper detection sensor	Adhesive mount	Cantilever beam with vertical or horizontal pins
Range	0.1 Hz to 100 kHz	80 kHz	3 MHz	Application dependent	±250 g (typical)	±10 g (typical)
Unique Features	–Voltage or charge mode settings –Multi-pole high- and low-pass filters –Adjustable gain	–Small size –Low mechanical Q –Shielded package	–Flexible –High bandwidth, low Q –Low impedance	–Low power –Custom shapes and sizes –High security	–Extremely high bandwidth –Low cost –Ultra-low power	–Very low cost –High sensitivity (1 V/g) –Ultra-low power (self generating)
Accuracy	Application dependent	Application dependent	Application dependent	Application dependent	±20% (typical)	±20% (typical)
Operating Temp	0°C to 40°C	-20°C to 80°C	-20°C to 60°C	-40°C to 85°C	-40°C to 85°C	-40°C to 70°C
Dimensions (mm)	150 x 100 x 100	6 dia x 9	12 x 30	Application dependent	18.80 x 13.21 x 6.10	19.05 x 6.35 x 6.35
Typical Apps	Low frequency dynamic strain, pyroelectric signals, machine vibration, piezo cable and traffic sensor interface	Air ranging, ultrasonic mouse, digitizers	Thickness measurement, speed of sound measurement, pulse/echo NDT	Encryption modules, POS card readers, PIN entry devices	Vibration sensing, gear box and high speed monitoring, high speed bearings and centrifuges, speaker motional feedback	Wake-up switch, load imbalance, antitheft devices, impact sensing, vital signs monitoring

scanners

solutions by sensor type

The aerodynamic research group of measurement specialties provides data systems based on the electronic pressure and temperature scanners of legacy brand Pressure Systems. These products have been developed specifically for wind tunnel testing, flight testing and turbomachinery test and measurement applications. Extensive factory calibration combined with custom MEMS-like technology provide system solutions with high accuracy digital interface to host computers and networks. Pressure ranges are available from 1.3" H_2O (300 Pa) to 10,000 psi (69 MPa). Temperature inputs can be acquired from standard and custom thermocouples as well as RTD's. Software is included with each solution.

Pressure and Temperature

NetScanner™ Complete Data Acquisition Devices

	9116	9146-R	9146-T	9022
Measurement Type	Pressure	Temperature	Temperature	Pressure
Media	Dry	RTD / TC / Volt	TC	Liquid
Accuracy	±0.05% FS	±0.25°C	±0.25°C	±0.05% FS
# of Channels	16	16 / 32	16	12
EU Throughput Rate	500 Hz	33 Hz	33 Hz	100 Hz
Enclosure	IP66 / 30g vibration	IP66 / 30g vibration	IP54 / 30g vibration	IP64 / 30g vibration
Typical Apps	Engine testing, portable data acquisition, wind tunnel research, process monitoring	Engine testing, portable data acquisition, wind tunnel research, process monitoring	Engine testing, portable data acquisition, wind tunnel research, process monitoring	Engine testing, third party transducers, close coupled requirements, high pressure

Pressure

NetScanner™ Complete Data Acquisition Devices

	9032	9034, 9038	98RK-1, 9816	Flight Data System NEW
Measurement Type	Barometer	Calibrator	Pressure	Pressure
Media	Dry	Dry	Dry	Dry
Accuracy	±0.01% FS	±0.01% FS	±0.05% FS	±0.05%
# of Channels	1	1	128	512
EU Throughput Rate	10 Hz	10 Hz	100 Hz	10 / 100 Base-T
Enclosure	Laboratory grade	Laboratory grade	19" rackmount / 4U	Flight grade
Typical Apps	Barometric monitor, precision reference	Calibration, transfer standard, verification testing	Turbine engine test, control room location	Flight testing

Pressure Scanners

Miniature High Density Pressure Scanners

	64HD DTC	32HD DTC	64HD, 32HD, 16HD	MicroScanner NEW
Type	Pressure	Pressure	Pressure	Pressure
Media	Dry	Dry	Dry	Dry
Accuracy	±0.03% FS	±0.03% FS	±0.05% FS	±0.10%
# of Channels	64	32	64, 32 or 16	16
Thermal Comp	Active (DTC)	Active (DTC)	Passive	Active
Port Sizes	0.040 in.	0.040 or 0.063 in.	0.040 or 0.63 in.	Direct mount
Typical Apps	Wind tunnel research, flight test, on vehicle research	Wind tunnel research, flight test, on vehicle research	Wind tunnel research, flight test, on vehicle research	For confined space, wind tunnel, flight test

Data Acquisition Systems

Multi-Scanner Data Acquisition Systems

	Optimus	Initium	Interface NEW	Pneumatics NEW
Type	Pressure scanning	Pressure scanning	A/D conversion	Quick disconnect
Media	Dry	Dry	Dry	Dry
Accuracy	±0.03% FS	±0.05% FS	±0.05% FS	N/A
# of Channels	2048	512	512	19, 31, 36, 55
EU Throughput Rate	650 Hz	1200 Hz	650 Hz	N/A
Enclosure	Laboratory grade	Laboratory grade	Miniature	Miniature
Typical Apps	Aerospace development	Wind engineering	In model placement, optimus system interface	Pressure connections for confined spaces

fluid properties

solutions by sensor type

Measurement Specialties approaches the measurement of fluids using two distinct technologies. Its patented tuning fork technology is coupled with efficient software algorithms for accurate measurement of viscosity, density and dielectric constant. Highly reliable reed switch technology is combined with temperature measurement for level sensing. Dedicated applications include, among others, oils (engine, hydraulic, transmission), fuels and DEF/AdBlue®* fluid monitoring.

Robust design enables Fluid Property sensors to operate under diverse pressure, flow and temperature conditions to bring real time fluid monitoring to engines, fuel systems, SCR systems, compressors, transmissions, gear boxes and many other industrial applications.

Our new Water in Oil measurement sensor supplements the existing fluid quality range of products.

*AdBlue® is a registered trademark of the Verband der Automobilindustrie e.V (VDA)

Fluid Property Sensors

FPS

Directly and simultaneously measures the fluid properties and temperature.

	FPS2810	FPS2840	FPS2860	HTM2500B3C4 OIL NEW
Package	Fully integrated, stand-alone module combines sensor and processing electronics for in-situ monitoring	Fully integrated, stand-alone module combines sensor and processing electronics for in-situ monitoring	Fully integrated, stand-alone module combines sensor and processing electronics for in-situ monitoring	Fully integrated, stand-alone module combines sensor and processing electronics for in-situ monitoring
Type	Engine oil quality sensor	Hydraulic oil quality sensor	Transmission oil quality sensor	Water content in oil and temperature sensor
Operating Range	Viscosity from 0.5 to 50 mPa-s Density from 0.65 to 1.5 g/cc Dielectric from 1.0 to 6.0	Viscosity from 0.5 to 50 mPa-s Density from 0.65 to 1.5 g/cc Dielectric from 1.0 to 6.0	Viscosity up to 20,000 mPa-s Density from 0.65 to 1.5 g/cc Dielectric from 1.0 to 6.0	0 to 1 aw (aw, activity = water content / water content in saturated oil)
Operating Temp	-40°C to 150°C	-40°C to 150°C	-40°C to 150°C	-40°C to 85°C
Unique Features	– Rugged construction for high pressure and high flow environments – CAN communication protocol (SAEJ1939 compliant)	– Rugged construction for high pressure and high flow environments – CAN communication protocol (SAEJ1939 compliant)	– Rugged construction for high pressure and high flow environments	– Full interchangeability – High reliability and demonstrated long term stability in oil – Ratiometric to voltage supply – Sensitive elements with unique mechanical and chemical robustness
Calibration	Factory calibrated with NIST traceable standards	Factory calibrated with NIST traceable standards	Factory calibrated with NIST traceable standards	Factory calibrated and tested
Dimensions (mm)	73.3 x 30 x 30	73.3 x 30 x 30	73.3 x 30 x 30	76.2 x 30 x 30
Typical Apps	Engine quality monitoring for on and off highway vehicles: degradation, oxidation, fuel dilution, soot contamination	Hydraulic oil quality monitoring for on and off highway vehicles, HVACR, compressors, industrial equipments, turbines: degradation, oxidation, water content	Transmission oil quality monitoring in high viscosity conditions for on and off highway vehicles, HVACR, compressors, industrial equipments, turbines: degradation, oxidation	Water content in oil and temperature monitoring for automotive, truck, transformers, industrial applications

	FPS2820 / FPS2830
Package	Fully integrated sensor and processing electronics provide a single sensor solution for in-line or in-tank fuel monitoring
Type	Fuel quality sensor
Operating Range	Viscosity from 0.5 to 50 mPa-s Density from 0.65 to 1.5 g/cc Dielectric from 1.0 to 6.0
Operating Temp	-40°C to 150°C
Unique Features	– Rugged construction for high pressure and high flow environments
Calibration	Factory calibrated with NIST traceable standards
Dimensions (mm)	73.3 x 30 x 30
Typical Apps	Diesel, biodiesel, jet, gasoline and flexfuel monitoring, fuel type detection, biodiesel concentration measurement, fuel quality monitoring for engines, turbines, electric power generation, aviation, marine, etc

DEF/AdBlue®* SCR Sensors

In-line DEF/AdBlue® Quality Sensor

	FPS5851HP NEW
Package	Fully integrated sensor and processing electronics provide a solid state sensor for in-line urea quality monitoring
Type	Urea quality sensor
Operating Range	Urea concentration from 5 to 62.5% mass
Operating Temp	-40°C to 125°C, urea concentration accuracy ± 1.0%
Unique Features	– Rugged SST-based construction for demanding environment (vibration, side-load) – Urea resistant DIN70070 / ISO22241 material – High reliability and long term stability – Integrated design to be installed directly on the pump output or on the dosing line – Optimized for OEM specifications
Calibration	Factory calibrated in compliance with DIN70070 / ISO 22241 standards
Dimensions (mm)	93 x 57 x 42 (+SAEJ2044 fluid connecting pipe)
Typical Apps	Monitoring urea concentration and urea quality of diesel exhaust fluid (DEF) used in selective catalytic reduction systems (SCR). Detection of unauthorized fluids for SCR systems applications

*AdBlue® is a registered trademark of the Verband der Automobilindustrie e.V (VDA)

DEF/AdBlue®* SCR Sensors

DEF/AdBlue® Level Sensors

	FLS RB Series	FLS RC Series NEW	FLS P Series	FLS PU Series
Package	Rubber header and stainless steel body	Rubber header and stainless steel body	Plastic header and stainless steel body	Plastic header and stainless steel body
Type	Combined level sensor, temperature sensor, filter, AdBlue® draw and return heater, collar header	Combined level sensor, temperature sensor, filter, AdBlue® draw and return heater, bayonet header	Combined level sensor, temperature sensor	Combined level sensor, temperature sensor, filter, AdBlue® draw and return heater, bayonet header
Operating Temp	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Features	–Available in a range of sizes –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header –Various collar adapter options	–Available in a range of sizes –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header	–Available in a range of sizes –High reliability –Reed switch technology	–Available in a range of sizes –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header

DEF/AdBlue® SCR Sensors with Quality Measurement

In-tank DEF/AdBlue® Level and Quality Sensors

	QLS RB Series NEW	QLS RC Series NEW	QLS PL Series NEW
Package	Rubber header and stainless steel body	Rubber header and stainless steel body	Plastic header and stainless steel body
Type	Combined level sensor with quality measurement, temperature sensor, filter, AdBlue® draw and return heater, collar header	Combined level sensor with quality measurement, temperature sensor, filter, AdBlue® draw and return heater, bayonet header	Combined level sensor with quality measurement, temperature sensor, filter, AdBlue® draw and return heater, screwed header
Operating Temp	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Operating Range	0% to 62.5% mass urea	0% to 62.5% mass urea	0% to 62.5% mass urea
Urea Concentration Accuracy	±2%	±2%	±2%
Features	–Available in a range of sizes –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header –Integrated quality sensor –Various collar adapter options	–Available in a range of sizes –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header –Integrated quality sensor	–Available in a range of sizes –Different types of foots (compact, normal and extended sizes) –High reliability –Reed switch technology –Using coolant system to thaw frozen –DEF / AdBlue® feed and return connections can be incorporated into the header –Integrated quality sensor –Bayonet adaptor option

*AdBlue® is a registered trademark of the Verband der Automobilindustrie e.V (VDA)

Glossary of Common Sensor Terms

Calibration
Testing of a sensor to confirm output is within a specified range for particular values of the input.

Compensated Temperature Range
The temperature range in which the sensor meets the specifications for Thermal Zero Shift and Thermal Sensitivity Shift.

DeviceNet™
Device level network for industrial automation.

Excitation
The recommended voltage with which a standard sensor should be excited.

Full Scale Output (FSO)
Full Scale Output (FSO) is the span between the lowest range limit and the highest range limit of the sensor. Published values are approximate values and may vary with each sensor.

Hysteresis
Hysteresis is the difference in sensor output signal at a specific input when applied in the increasing and then decreasing sectors of a single cycle of short time duration at constant temperature. It is expressed as a percentage of FSO.

Natural Frequency
Natural Frequency is the frequency at which the sensor's active sensing element goes into resonance and responds with maximum movement for a specific applied input.

Non-Linearity
Non-Linearity is the deviation of the sensor output signal from a theoretical straight line which has been fitted to the data points of an actual calibration. It expresses the maximum deviation of all data points in that calibration and is sometime expressed as a percentage of FSO, usually as a ±% error band, or % of reading.

Non-repeatability
Non-repeatability is the deviation in sensor output signal levels when a specific input is applied in consecutive cycles of short time duration under the same conditions, such as temperature and direction of increasing or decreasing input. It can be determined by performing two consecutive short time duration calibration cycles and can be expressed as ±%FSO.

Operating Temperature
Temperature at which a sensor will operate. Use of a sensor outside of its operating temperature range may result in sensor failure.

Operating Temperature Range
The temperature range in which the sensor functions without damage from thermal effects. Exposure to temperatures above or below the Operating Temperature Range may cause permanent damage to the sensor.

Overrange Limit
The Overrange Limit is the maximum input to which the sensor can be exposed without damage.

Plug and Play
Sensors designed for end-users who expect sensors to meet calibration performance standards once power and signal cables are properly connected to instrumentation.

Root Mean Square
The square root of the arithmetical mean of a set of squared instantaneous values

Sealing
Sealing is the assembly method by which the sensor is protected from moisture in the surrounding environment. The most desirable sealing method is hermetically seal. This can be achieved by joining the individual piece parts together by soldering, welding, brazing, glassing, or other commonly accepted manufacturing processes. Another common sealing method is epoxy seal. It is achieved by joining the piece parts by applying adhesive or potting compound to mitigate the incursion of moisture into the sensor assembly.

Sensitivity
The sensor's change in output per the unit change in the physical parameter being measured. The change may be linear or non-linear.

Thermal Sensitivity Shift (TSS)
The change in sensitivity of the sensor as a function of temperature. It is usually expressed as a percent reading change in sensitivity for a specified change in temperature such as ±0.01%/°C and is generally linear with moderate temperature changes. The Thermal Sensitivity Shift can be eliminated or minimized by using sensitivity numbers determined at or near the temperature of use.

Thermal Zero Shift (TZS)
The change in the Zero Offset as a function of temperature is the Thermal Zero Shift. It may be expressed as either a %FSO for a specific temperature change such as ±0.01%FSO/°C or in voltage units such as ±0.2mV/°C and it is not a linear function.

Total Error Band
Typically expressed as a percentage, the TEB is the combination of possible errors for a sensing device within its measurement range and temperature of operation.

Common Abbreviations:

AC	Alternating Current
ATM	Automatic Teller Machine
CAN	Controller Area Network
CE	Communauté Européenne
CENELEC	European Committee for Electrotechnical Standardization
CSA	Canadian Standards Association
CT	Computed Tomography
cUL	Tested to Canadian Standards by Underwriters' Laboratories
DEF	Diesel Exhaust Fluid
DTC	Digital Temperature Compensation
EMI	Electro-Magnetic Interference
ESA	European Space Agency
FM	Factory Mutual
FSO	Full Scale Output
HUMS	Health Usage and Monitoring System
HVD	High-Voltage Differential
IEC	International Electrical Commission
IEPE	Integral Electronic Piezoelectric
IP	Ingress Protection
ISO	International Organization for Standardization
kHz	Kilohertz
LIN	Local Interconnect Network
LVD	Low Voltage Differential
LVDT	Linear Variable Displacement Transducers
mA	Milliamp
mm	Millimeter
mV	Millivolt
NASA	National Aeronautics and Space Administration
NEMA	National Electrical Manufacturers Association
NIST	National Institute of Standards and Technology
NPN	Negative-Positive-Negative transistor
NPT	National Pipe Tapered
NTC	Negative Temperature Coefficient
OEM	Original Equipment Manufacturer
PCB	Printed Circuit Board
PDM	Pulse Density Modulation
PE	Piezoelectric
PWM	Pulse Width Modulation
PSI	Pounds Per Square Inch
RFI	Radio Frequency Interference
RH	Relative Humidity
RMS	Root Mean Square
RoHS	Restriction of Hazardous Substances
RPM	Revolutions Per Minute
RTD	Resistance Temperature Detector
SAE	Society of Automotive Engineering
SCR	Selective Catalytic Reduction
SDI-12	Serial Data Interface at 1200 Baud
SMD	Surface Mount Device
SPI	Serial Peripheral Interface
SPST	Single Pole Single Throw
TDFN	Thin Duel Flats No Leads
TPMS	Tire Pressure Monitoring System
TEB	Total Error Band
UL	Underwriters Laboratories
USB	Universal Serial Bus
VDC	Volts Direct Current
WEEE	Waste Electrical and Electronic Equipment

worldwide resources

Measurement Specialties is a unique sensor business that combines the strengths and experiences of several merged sensor companies to resolve challenging physical measurement problems. Our products have a proud lineage from the pioneering work of ICSensors in MEMS (micro electro-mechanical systems) technology and Schaevitz in inductive position sensing. During the last decade, we have significantly expanded our product offerings and enriched our technical capabilities through additional strategic acquisitions, including:

– **Spectrum Sensors.** Custom temperature probes, encoders and inertial sensors.

– **Cosense.** Ultrasonic sensors.

– **Gentech.** Liquid level, position, flow and optical sensors.

– **Celesco.** Rotary and linear position sensors.

– **Eureka Environmental Engineering.** Multiparameter instrumentation and software for water quality monitoring.

– **Pressure Systems, Inc.** Pressure scanners and water level measurement.

– **Intersema Sensoric.** Low power, MEMS pressure sensors, electronics and custom modules.

– **Humirel.** Capacitive humidity sensors and modules, as well as multi-parameter sensing assemblies.

– **HL Planartechnik.** Planar mass air flow elements, multi-layer magneto resistive sensors, thermopiles and various custom thin film MEMS structures.

– **ENTRAN / FGP.** Custom pressure, force, acceleration and torque sensors.

– **BetaTHERM / YSI / Atexis / RTD Company.** NTC, PTC, RTD, and thermocouple temperature sensors and custom probes.

– **Sensotherm.** A leader in the design and manufacture of platinum (Pt) thin film RTD temperature sensors.

Today, united under the MEAS brand, our multinational workforce of 3000+ is dedicated to the design and manufacturing of sensors for customers in more than 60 countries. We have design engineering and manufacturing locations strategically positioned around the globe in order to put resources close to our customers.

Toulouse, France
European Headquarters
Humidity Mfg/R&D
Fluid Property Mfg/R&D

Galway, Ireland
Temperature Mfg/R&D

Fontenay Tresigny, France
Temperature Mfg/R&D

Les Clayes-Sous-Bois, France
Force - Torque Mfg/R&D
Vibration - Pressure Mfg/R&D

Bevaix, Switzerland
Pressure Mfg/R&D

Dortmund, Germany
Position - Temperature Mfg/R&D
Foundry Services

Nuremberg, Germany
Temperature Mfg/R&D

Kormend, Hungary
Temperature Mfg/R&D

Shenzhen, China
Asian Headquarters
Various Sensors Mfg/R&D

Chengdu, China
Temperature Mfg/R&D

Tokyo, Japan
Nikkiso-Therm Co., Ltd
Joint Venture

measurement SPECIALTIES™

sensing your world™

WHAT CAN WE **SENSE** FOR YOU?

Measurement Specialties welcomes the opportunity to work with you to develop sensor solutions that meet or exceed your application requirements.

Visit the Contact Us section of our website (www.meas-spec.com) to find a location nearest you or email us directly for technical and product information.

Engine and Vehicle: e&vatmeas-spec.com

Medical: medicalatmeas-spec.com

General OEM / Industry: oematmeas-spec.com

Consumer Goods / Appliance: consumeratmeas-spec.com

Test and Measurement: t&matmeas-spec.com

Military / Aerospace: mil-aeroatmeas-spec.com

HVACR / Building Equipment: hvacratmeas-spec.com

Environmental Monitoring: environmentalatmeas-spec.com

Global/North American Headquarters
Measurement Specialties, Inc.
1000 Lucas Way
Hampton, VA 23666
+1 757 766 1500
+1 800 745 8008

European Headquarters
MEAS Europe
Impasse Jeanne Benozzi
CS 83163
31027 Toulouse Cedex 3
+33 582 082 200

Asian Headquarters
Measurement Specialties (China), Ltd.
No. 26 Langshan Road
Shenzhen High-Tech Park (North)
Nanshan District, Shenzhen 518057, China
+86 755 3330 5088

www.meas-spec.com

sensors.helpatmeas-spec.com

NASDAQ: MEAS

© 04/2014 Measurement Specialties, Inc.
All rights reserved.

CO1000